June 1983
vol. 9, no. 6
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Word Processing For Home & Office

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In-Depth Evaluations:

- AppleWriter Extended
- Screenwriter II
- AppleWriter II
- Executive Secretary
- Personal Secretary
- Bank Street Writer
- Word Juggler
- PowerText
- Perfect Writer
- Gutenberg
- Newscript
- Daisy
- MagicPrint
- Zardax
- ListMaker
- Mannesmann Tally Printer
- SooperSpooler
- Power Case System
- Sprinter II
- Full View-80

The West Coast Computer Faire

Easy Writer Made Easy

Olivetti Praxis Printer Conversions

Star Gazing

World Builder

Soaring Cycles

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WORD PROCESSING
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ANNOUNCING
THE END OF
THE DISPOSABLE
COMPUTER.

THE REMARKABL
SV-318 PERSONAL COM
You'll grow into it, not out

SPECTRAVIDEO
SV-318
FO

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SV-601 SUPER EXPANDER

The real value in any computer system lies in its ability to accommodate a large variety of input/output devices simultaneously. With the addition of the SV-601, the SV-318 can interface with as many as seven different devices at one time. Although lightweight, the SV-601 can support a 15" T.V. monitor. Special front view slots have been designed to monitor the operation of the different interface cards that are connected to the system.

SV-903 DATA CASSETTE

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ENTER
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Man has only recently tested the waters of the home computer age, and he has found the waters to his liking. But with a brain capable of storing several trillion bits of information, he will be continually pushing his new found toy to greater limits. Will his machine live up to this challenge?

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CAPABILITY. The SV-318 isn't just more capable. It's much more capable. No other computer at even twice the price combines all these extraordinary features: 32K ROM expandable to 96K; 32K RAM expandable to 144K; Extended Microsoft Basic (the industry standard); even Standard CP/M 80-column capability so you can immediately utilize over 10,000 existing software programs. The SV-318 also has a unique built-in joystick/cursor control—an immeasurably useful feature when it comes to playing your favorite video game.

EXPANDABILITY. As you become more and more skillful with computers, you'll love how the SV-318 "stretches" to meet your demands (and actually leads you in fascinating, new directions). For one thing, all eleven of our important peripherals are available immediately. With most other models, you have to wait months. For another, the SV-318 is beautifully designed to interface with new options as they become available.

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	SPECTRAVIDEO SV-318	APPLE II PLUS	ATARI 800	COMMODORE 64	NEC 6001	RADIO SHACK COLOR COMPUTER
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COMPUTING POWER FEATURES						
BUILT-IN ROM	32K	12K	10K	20K	16K	8K
EXPANDABLE TO	96K	N/A	42K	N/A	32K	16K
BUILT-IN EXTENDED MICROSOFT* BASIC	YES	YES	ADDITIONAL COST	NO	YES	ADDITIONAL COST
BUILT-IN RAM	32K*	48K	16K	64K	16K	4K
EXPANDABLE TO	144K**	64K	48K	N/A	32K	16K
KEYBOARD FEATURES						
NUMBER OF KEYS	71	51	61	66	71	55
USER DEFINE FUNCTIONS	10	N/A	4	8	10	NONE
SPECIAL WORD PROCESSING	YES	NO	NO	NO	NO	NO
GENERATED GRAPHICS (FROM KEYBOARD)	YES	NO	YES	YES	NO	NO
UPPER/LOWER CASE	YES	UPPER ONLY	YES	YES	YES	YES
GAME/AUDIO FEATURES						
SEPARATE CARTRIDGE SLOTS	YES	NO	YES	NO	NO	NO
BUILT-IN JOYSTICK	YES	NO	NO	NO	NO	NO
COLORS	16	15	128	16	9	9
RESOLUTION (PIXELS)	256 x 192	280 x 160	320 x 192	320 x 200	256 x 192	128 x 64
SPRITES	32	N/A	4	8	N/A	N/A
SOUND CHANNELS	3	1	4	3	3	1
OCTAVES PER CHANNEL	8	4	4	9	8	10
A.D.S.R. ENVELOPE	YES	NO	NO	YES	YES	NO
PERIPHERAL SPECIFICATIONS						
CASSETTE	2 CHANNEL	1 CHANNEL	2 CHANNEL	1 CHANNEL	1 CHANNEL	1 CHANNEL
AUDIO IO	YES	NO	YES	NO	NO	NO
BUILT-IN MIC	YES	NO	NO	NO	NO	NO
DISK DRIVE CAPACITY	256K	143K	96K	170K	N/A	170K
(LOW PROFILE)	YES	NO	NO	NO	NO	NO
CP/M* COMPATIBILITY (80 column programs)						
CP/M* 2.2	YES	NO***	NO	NO ****	NO	NO
CP/M* 3.0	YES	NO	NO	NO	NO	NO

record
the
ssette
age
sed
nue to
n

o help

SV-902 FLOPPY DISK DRIVE

This extremely compact, low profile unit uses standard 5¼" flexible diskettes. Its single side double density configuration allows a capacity of 256K bytes of data (unformatted). Linked to the Super Expander, the SV-902 is your key to the virtually unlimited scope of CP/M O/S as well as a complete variety of program languages such as LOGO, PASCAL, FORTRAN, COBOL and PL-1.

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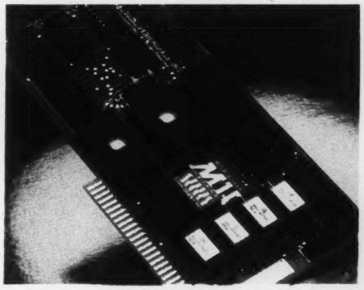
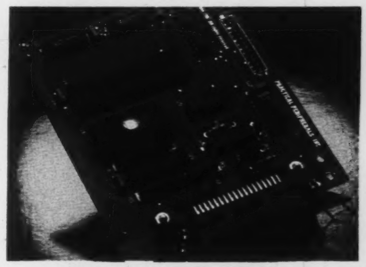
Whatever your system, there is a specific Microbuffer designed to accommodate it.



FOR APPLE II COMPUTERS, Microbuffer II features on-board firmware for text formatting and advanced graphics dump routines. Both serial and parallel versions have a power-efficient low-consumption design. Special functions include Basic listing formatter, self-test, buffer zap, and transparent and maintain modes. The 16K model is priced at $259 and the 32K, at $299.



FOR EPSON PRINTERS, Microbuffer/E comes in two serial versions — 8K or 16K (upgradable to 32K) — and two parallel versions — 16K or 32K (upgradable to 64K). The serial buffer supports both hardware handshaking and XON-XOFF software handshaking at baud rates up to 19,200. Both interfaces are compatible with standard Epson commands, including GRAFTRAX-80 and GRAFTRAX-80+. Prices range from $159 to $279.

MICROBUFFER

ALL OTHER COMPUTER/PRINTER COMBINATIONS are served by the stand-alone Microbuffer In-line.

The serial stand-alone will support different input and output baud rates and different handshake protocol. Both serial and parallel versions are available in a 32K model at $299 or 64K for $349. Either can be user-upgraded to a total of 256K with 64K add-ons — just $179 each.

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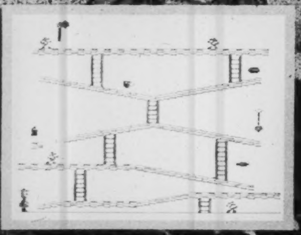
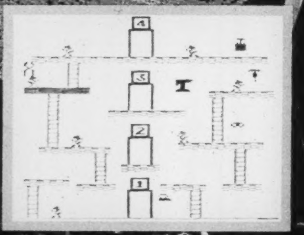
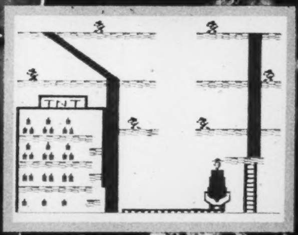

Round 1: The Mine Shaft.
Sharpen your miner's skill!


Round 3: The Transporters.
Beam yourself up!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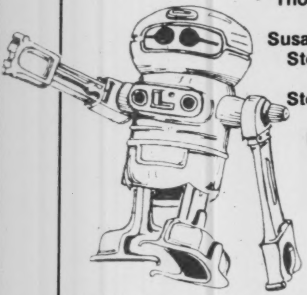

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K-orrection

Dear Editor:

In your April 1983 issue of *Creative Computing*, it was printed that K-Byte was recently purchased by CBS. That statement is incorrect. K-Byte is a complete software development and manufacturing company devoted to servicing many software merchandisers.

K-Byte and CBS Software have a long-term contractual agreement whereby K-Byte provides CBS Software with computer software and manufacturing.

Scott McFarland
Marketing Director
K-Byte
P.O. Box 456
1705 Austin
Troy, MI 48099

Manual Overdrive

Dear Editor:

We must thank John Anderson for his article on the Vic-1540 disk drive, contained in the 1983 Buyer's Guide. Had we purchased our 1540 prior to reading Mr. Anderson's review, I know it would have led to the termination of our budding computer addiction or our sanity.

Luckily we saw Mr. Anderson's article before we purchased the 1540. The manual would have left us totally confused, even though we now know what to expect from printed instructional material. It's impossible to detect errors if one does not understand the instructions in the first place.

Anyway, thanks to Mr. Anderson's User's Menu, we were able to plunge right in and enjoy using our disk drive.

Vini Wronski and family
P.O. Box 45
Boston Bar, B.C.
Canada VOK 1CO

Tiny Text Templates

Dear Editor:

I recently purchased *Text Wizard* for my Atari 800 personal computer, and am quite satisfied with its capabilities. In fact, it performs one function that the documentation fails to mention. Since the same may well be true of other text processors, I thought it might interest your readers.

This software allows me to read in a text file to which I will simply append new material. Furthermore, it also recognizes printing commands which are imbedded in the text. Therefore, several text files consisting only of printing commands can be created. One of these tiny files can be designed for personal letters, one for business letters, one for memos, etc. I give these files very short names like P, B, and M. In each I put the appropriate formatting commands and for business letters, even my return address.

To use the file, I load it under its tiny name, add the new text, and then save it under a longer, more descriptive name (e.g., JULYMEMO). It makes my life a lot easier.

Robert E. Petersen
1081 Chandler St.
Tewksbury, MA 01876

Pointer Pointers

Dear Editor:

I have made a few improvements in my program "Financial Analysis for the Apple" (February, 1983, page 188) and would like to point out a potential "trap" which readers typing the program may encounter.

The Applesoft Speedup routine used in the Review Data subroutine (4000 series) and Sort subroutine (7000 series) temporarily modifies the Applesoft pointers to the beginning of the program. Thus if the program terminates in either of these subroutines (as can occur if typing errors are present) the pointers will not be restored as they are in a normal exit from the routines. If this occurs it will appear that the entire program preceding the subroutine has been lost (try listing the program). To recover the entire program type POKE 103,1: POKE 104,8. I recommend that readers save the program (after verifying that the pointers are normal) before running it.

To prevent the program from trying to delete record numbers higher than the last record which has been entered change line 3130 to 3130 D2 = VAL(A$): IF D2 > NS THEN D2 = NS and add line 3135 IF D2 < > 0 THEN 3170.

The program will not delete a range of data if the "To" date is the same as or after the date of the last active record. To fix this deficiency add line 3255 IF N > NR THEN 3030 and change line 3270 to GOSUB 3200: N = I: GOTO 3255.

If line 4110 is changed to POKE 34, PEEK(37): IF NR = 0 THEN 4240 the program will not display one record of data even if all data have been deleted.

Readers who want to output the Nominal annual interest rate in addition to the Effective interest rate may do so with the following modifications: add line 5195 PRINT TAB(TB + 5)

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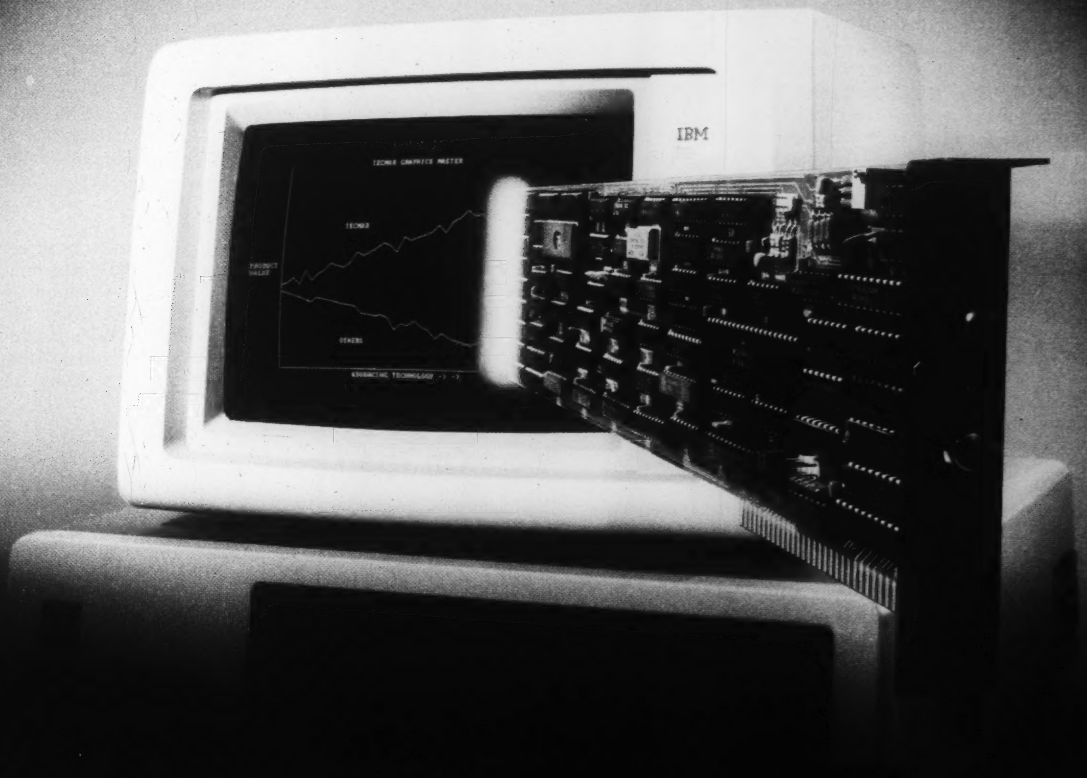

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For further information about our Graphics Master™ and the largest line of options available anywhere for the IBM Personal Computer, call or write for the latest catalog of PC-Mate™ peripherals from Tecmar.

TECMAR
The Next Step

Personal Computer Products Division
23600 Mercantile Road
Cleveland, Ohio 44122
Phone 216-464-7410/Telex 241735

CIRCLE 274 ON READER SERVICE CARD

"NOMINAL ANNUAL INTEREST": PRINT TAB (TB + 5) "RATE =";: XX = K1*IR: GOSUB 6030: PRINT "%", delete the final PRINT from line 5520 and add line 5525 PRINT TAB(20) "NOMINAL ANNUAL INTEREST RATE =";: XX = K1*IR: GOSUB 6030: PRINT "%": PRINT.

Finally, since the program is fairly long (58 sectors) and rather difficult to type, I will provide copies (including the modifications) to readers who send $5.00, a blank diskette, and a self-addressed, stamped (9-1/2" by 6-1/2") manila envelope to me at the address below. Copies will be made using DOS 3.3 (16 sector) format unless DOS 3.2 (13 sector) is requested.

Skene H. Moody
1754 St. Albans Rd.
San Marino, CA 91108

A Fair Accounting

Dear Editor:

Ron Exner's review of *General Ledger* by B.P.I. is, in general, both fair and accurate. However, he implies in his article that *General Ledger* will ensure compliance with Generally Accepted Accounting Principles (G.A.A.P.). He in fact states "...the user can forget about Generally Accepted Accounting Principles..." Anyone who understands the concept of G.A.A.P. will realize at once that this is not true. I suggest that, at present, it is impossible to find any computerized accounting package that does ensure compliance with G.A.A.P.

A computer package is not capable of exercising the professional judgments required. In particular, it will not be able to select *appropriate* accounting policies. It will not, for example, know how to value inventory or how to depreciate fixed assets.

A computer package can not ensure that transactions are properly coded. Thus, the package does not even ensure the proper application of accounting policies.

The financial statements produced by these packages do not provide all the information which G.A.A.P. requires. This information includes such things as the accounting policies used. At best, such statements are suitable for internal use by people who are already familiar with such information.

A computer package would not usually know which country it is in. This is important information. Canadian G.A.A.P. are not the same as G.A.A.P. in the U.S.A., and the U.K. uses yet another version.

John G. Bliss
Chartered Accountant
202-115 2nd Ave. North
Saskatoon, Saskatchewan
Canada S7K 2B1

Dynamotives

Dear Editor:

Christopher Light's review of our Micro-DYNAMO package was so positive that we hate to quibble with it over the fine points of Apple's Pascal system. However, we think that his explanation of saving files could be misleading to your readers.

As Mr. Light said, we recommend the W option for writing files to disk. One reason for this is that when the user tries to write a new file under a name which is already on the disk, the Pascal system will verify that the old file should be destroyed before it will write the new file over the old. The U (for Update) option Mr. Light used always writes to the file SYSTEM.WRK.TEXT, the Editor's, but *not* Micro-DYNAMO's, default file. So long as SYSTEM.WRK.TEXT exists, it is impossible to edit any other file, and getting rid of it is not a trivial task (Q for quit, E for exit, F for filer, N for new work file, Q for quit, and E for edit).

We appreciate *Creative Computing's* constructive criticisms of our product, and are using them to improve the forthcoming version of Micro-DYNAMO for the IBM Personal Computer.

Pilar A. Carrasco (Ms.)
Pugh-Roberts Associates, Inc.
Five Lee Street
Cambridge, MA 02139

More On The TP-1

Dear Editor:

I read, with the interest of a new owner of a Smith-Corona TP-1, David Mannering's article "Low Cost Letter Quality Printing" (*Buyer's Guide*, 1983, page 98). The article has several discrepancies and omissions that I will address in this letter.

The most distressing statement concerns the stop printing feature associated with "lifting the top cover." This feature is a safety measure to prevent printer start up during ribbon or printhead changes rather than as a routine manual stop print function. Most good software that drives a printer will provide a start/stop print command. For example, a stop print command using *WordStar 3.0* is accomplished by typing the character P.

A distinction should have been made between the accessibility of the line spacing control and the inaccessibility of the light/dark impression control. The line spacing control can be adjusted with the paper stand/dust cover in the open position. However, to adjust the light/dark impression control, you must lift up the cabinet top housing. In most applications, the infrequency of making this latter adjustment was probably the reason that the control is not readily accessible.

Mr. Mannering leads the novice reader to believe that *WordStar's* bold face, double strike, underlining and strike out features are "completely disabled" with the TP-1. These features are available by selecting option 2 ("a printer that will backspace"). Superscripts and subscripts are also available as full line shifts.

The article failed to mention that there are missing characters (< >/∧) on the Pica 10 daisywheel. These characters are used by accountants and for program listings. Mention should also have been made of the lack of baud rate information from Smith-Corona. This information could be critical if the baud rate of the computer is fixed. Since the TP-1 is available with either a parallel or a standard RS-232 interface, the proper cord should be supplied with the unit for an additional charge.

Brooke R. Stephens
Marketing Services and Consulting
4515 La Tierra Lane
Carpinteria, CA 93013

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TRIPLE ACTION
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CIRCLE 193 ON READER SERVICE CARD

SPINNAKER'S LINE OF EARLY LEARNING GAMES IS GROWING AS FAST AS YOUR CHILD'S MIND.

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Some of the games you see on these two pages help exercise your child's creativity. Others help improve vocabulary and spelling skills. While others improve your child's writing and reading abilities. And all of them help your child understand how to use the computer.

So if you're looking for computer programs that do more than just "babysit" for your kids, read on. You'll find that our Early Learning Programs are not only compatible with **Apple,® Atari,® IBM®** and **Commodore 64™** computers, but also with kids who like to have fun.

HEY DIDDLE DIDDLE
Unscramble the verses. Put together the nursery rhymes. And watch them come to life.
Ages 3-10
SPINNAKER
We make learning fun.

HEY DIDDLE DIDDLE™ Poetry in motion. Ages 3 to 10.

Kids love rhymes.

And since HEY DIDDLE DIDDLE features 30 classic rhymes with full color graphics and the neatest computer music you've ever heard, it makes rhyme games more fun than ever before.

Plus, it makes it fun for kids to read, helps them understand how words and rhymes create poetry and lets them take fragmented thoughts and rearrange them to form coherent verse.

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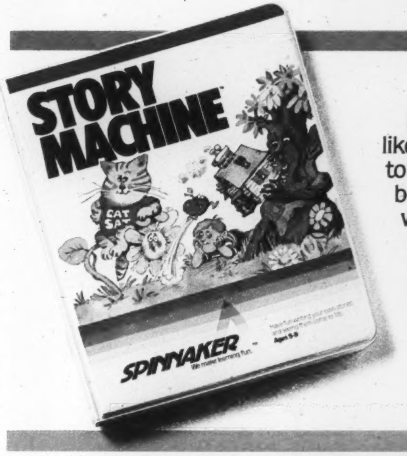

STORY MACHINE
CAT SAT
SPINNAKER
We make learning fun.
Ages 5-9

The story of STORY MACHINE™ Ages 5 to 9.

THE BOYS WALK TO THE HOUSES.

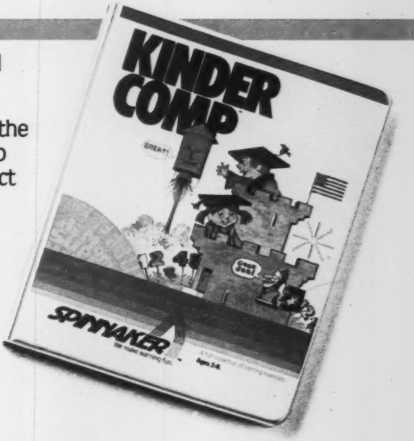
STORY MACHINE is like a storybook come to life. Using the keyboard, your children write their own fun little stories. The computer then takes what they've written and animates their story on the screen, complete with full color graphics and sound.

STORY MACHINE helps your children learn to write correctly, become familiar with the keyboard, and lets them have fun exercising their creativity at the same time.

KINDERCOMP™ Numbers, shapes, letters, words and drawings make fun. Ages 3 to 8.

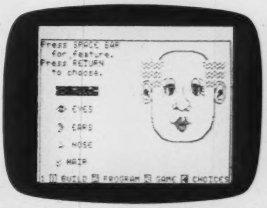
KINDERCOMP is a game that allows very young children to start learning on the computer. It's a collection of learning exercises that ask your children to match shapes and letters, write their names, draw pictures, or fill in missing numbers. And KINDERCOMP will delight kids with colorful rewards, as the screen comes to life when correct answers are given.

As a parent, you can enjoy the fact that your children are having fun while improving their reading readiness and counting skills.


KINDER COMP
GREAT!
Good Job!
SPINNAKER
We make learning fun.
Ages 3-8

FACEMAKER
SPINNAKER
We make learning fun.
Ages 4-12

FACEMAKER™ makes faces fun. Ages 4 to 12.


Press SPACE BAR for feature.
Press RETURN to choose.
EYES
EARS
NOSE
HAIR
1 BUILD 2 PROGRAM 3 GAME 4 CHOICES

FACEMAKER lets children create their own funny faces on the screen. Once a face is completed, your children will giggle with delight as they make it do all kinds of neat things: wink, smile, wiggle its ears, or whatever their imagination desires.

Plus, FACEMAKER helps children become comfortable with computer fundamentals such as: menus, cursors, the return key, the space bar, simple programs, and graphics. FACEMAKER won't make parents frown because their children will have fun making friends with the computer.

SPINNAKER™
We make learning fun.

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In Search Of A Word Processor

Ernest E. Mau

Word processing—two of the most magical words in microcomputing. You have only to scan the shelves of a newsstand to find dozens of articles on the subject, and it has quickly become one of the most popular applications for small computers. Everyone who buys a computer for the home or the office wants to get into word processing.

Just a few years ago, word processing cost so much that only a few well-financed companies could afford the equipment and programming. Now, effective systems and the software to run them can be obtained for as little as $2000, allowing anyone from the individual wishing to write personal letters, through small companies such as one-person consulting firms, to major corporations to pick and choose from a variety of systems and approaches.

Hardware and software suppliers have jumped into the field, eager to cash in on the popularity of automated typing. Today, it is hard to find any microcomputer system that doesn't run at least one such processor. Most modern microcomputers are capable of running a bewildering number of word processors with different approaches and methods. For just the Apple II, I have identified more than 35 word processing software packages ranging from under $100 to more than $500 with a variety of features that will satisfy almost any need.

Yet the popularity of this application also creates a difficult and often hazardous situation for the user. There are so many packages and so many conflicting viewpoints concerning what a system should do and how it should do it, that the individual seeking to acquire a first word processor or expand into a new and more capable one faces a difficult choice.

The selection of a word processor is complicated because computer software is not warranted for "fitness for purpose," meaning that once the package is purchased it cannot be returned just because it doesn't accomplish the desired tasks and doesn't reach the necessary objectives. If you buy a system and it doesn't work, you are stuck with it.

As a full time free lance writer, I live with word processing every day, grinding out between 5000 and 8000 pages a year and working ten or more hours a day, seven days a week. For the last four and half years, every word I have written has passed through a word processor, and I have used many software packages on several computer systems, including both S-100 bus machines and an Apple II Plus.

In this article, I shall take a critical look at five popular word processing programs for the Apple. Understand that I am not attempting to categorize any processors as "good" or "bad" or as "better" or "worse" than any others. What I want to show is that there are differences between them and that a given package may or may not be suited to a particular application or set of circumstances. Every user has to determine the features needed, the types of documents to be processed, the formatting requirements desired, and numerous other considerations based on his own purposes.

I can say that I have never found a perfect word processor—no matter how many features and capabilities a package may have, none has incorporated all the useful features into a single package. In short, don't be surprised if no package exactly fits your needs. You will probably have to make some compromises, and, like me, you might need two or more word processors to cover your range of applications.

Before describing the individual word processors, their features, and their shortcomings, it is useful to summarize the presence or absence of particular functions in a side-by-side tabular format. Table 1 provides such a comparison, showing many common features and identifying their presence with an X in the corresponding column.

This table is not all inclusive, and many of the packages have functions not reflected, sometimes because they are unique to one package. Furthermore, some programs may have some form of a feature shown to be lacking, but such cases usually require steps beyond the ordinary; in other words, the word processor may support the operation indirectly but without easy implementation by the average user or without documentation in the instructions.

Table 2 provides a summary by rating each word processor in seven categories. Within each category, the programs are rated from one to five according to my opinion of their relationship to each other. Of course, this rating system is subjective and is influenced by personal preferences, although an attempt has been made to minimize individual taste.

For example, in rating the relative ease of use, I standardized my test by using the same 26-page document with

---

Ernest E. Mau, 3108 South Granby Way, Aurora, CO 80014.

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In the fast moving, high technology world of microcomputers, the need for high performance accessories often gets overlooked.

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The easy-to-use *Discwasher® Disk Drive Cleaner* is both a problem preventer and problem solver. Its dry format safely cleans single or double-sided drives without altering the delicate head alignment or doing possible damage to rubber drive parts with solvents.

The *Discwasher® Computer Cassette Drive CareSet™* is a total maintenance package for your cassette drive system. It includes both the Discwasher® Computer Cassette Drive Head Cleaner and the Computer Cassette Drive Mechanism Cleaner. Together, these two maintenance units can keep the high resolution heads and the critical drive system of your cassette drive system in optimum performance.

The *Discwasher® DiscKeeper™* is a magnetically shielded storage system for floppy disks that takes up no more space than conventional folder packs. DiscKeeper protects against stray magnetic fields which can destroy valuable software. Three DiscKeeper sizes provide loss-free storage and protection for transporting any size disk format.

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CIRCLE 169 ON READER SERVICE CARD

each processor, seeking the same or similar formatting, and comparing the times required to obtain printouts. It wasn't a perfect test, but it put each word processor through a comparable exercise. Just remember that your preferences may differ from mine and you will have to make your decisions accordingly.

Zardax

Zardax is one of those pleasant surprises that come along occasionally—a nicely designed package that does what is expected of it with minimum difficulty. Provided by Computer Solutions in Australia, *Zardax* is marketed in the United States by Action Research Northwest. Although it is the most expensive of the Apple word processors reviewed here, it is not the most expensive one available.

Overall, *Zardax* is well thought out, and unlike some other products, it doesn't sacrifice useful features to achieve user-friendliness. Too often, software designers go for the marketing buzzwords and special frills that look good in a showroom, but they compromise the usefulness of the product by cutting back on features and commands many users could employ to good advantage. *Zardax* is, however, a balanced product, requiring few compromises by the user.

Tables 1 and 2, show that *Zardax* includes many features. In fact, it is second only to On-Line Systems' *Screen-Writer II* in terms of the number of functions it provides. Yet, operation is simple. Once the program has been configured to the hardware, it requires little more than a fast boot and run to begin preparing a document.

Text entry isn't much different from a standard typewriter, although proper use of the formatting and control commands requires a bit of study and thought. It is also worth noting that text entry and editing are accomplished without the mode switching commonly required in other word processors, making for convenient operation.

Documentation

All features and controls are well documented; the manual is written and organized in a semi-tutorial form. That is, the manual follows a systematic teaching approach while attempting to organize the material as a useful reference. However, the manual is not indexed, so there are occasions when finding specific information is a bit difficult or time consuming.

The *Zardax* program disk includes sample files that are pre-established practice documents. Despite the number of things that can be done with this package, I felt comfortable using it after only three hours of testing and experimentation.

creative computing

SOFTWARE PROFILE

Name: Zardax

Type: Word processor

System: Apple II, IIE 48K

Format: Disk

Language: Machine

Summary: Very powerful, yet simple to use.

Price: $295

Manufacturer:

Computer Solutions
Box 397, Mount Gravatt
Queensland, Australia
in the U.S.:
Action-Research Northwest
11442 Marine View Dr. S.W.
Seattle, WA 98146

This article doesn't allow room for a detailed analysis of each function. It is sufficient to know that those listed in the tables do work effectively. Instead of describing the entire word processing procedure, I shall address some of the less obvious requirements and a few things that may prove bothersome to some users.

Hardware

First, *Zardax* works on almost any Apple II system whether it is a minimum configuration or has been equipped with enhancements. It doesn't even need a lowercase adapter because it uses high-resolution graphics for the 40-column mode, though it doesn't employ the compressed text displays available with other programs.

It can also be run with any of several 80-column boards. The supplier specifically names the Vision-80, SmartTerm, DoubleVision, Sup'R'Terminal, and Videoterm as usable display enhancements. However, the Vista *Vision-80* is the board recommended. I performed my testing with a Videx Videoterm, finding it quite satisfactory, although that particular board should be equipped with an alternate character ROM.

If not equipped with either the "inverse character" ROM or a special *Zardax* ROM available from Videx, the Videoterm does not give any visible indication of underlining. Do not purchase an 80-column board for use with *Zardax* until you have seen the board and software in operation together.

You may find that the 40-column display is less satisfactory than the 80-column. This program assumes that all characters affecting the text must be visible on the screen. Therefore, the 40-column mode substitutes a mid-line dot for all spaces, meaning words are separated by dots vertically centered between the top and bottom of the line.

In a way, it is nice to know that a location is occupied by a character, but I dislike the screen clutter and feel it is hard to read, especially for large quantities of text. In the 80-column mode, spaces are blank, and the processor parallels more conventional approaches.

Although *Zardax* functions admirably without an additional RAM card, its performance is enhanced with such a card. A 16K RAM card increases the text held in memory for editing, thereby speeding the editing process. As a practical limit, I found 10 to 12 single-spaced pages was a good working average for a single text file, allowing room for editing, changes, additions and deletions without having to subdivide the file.

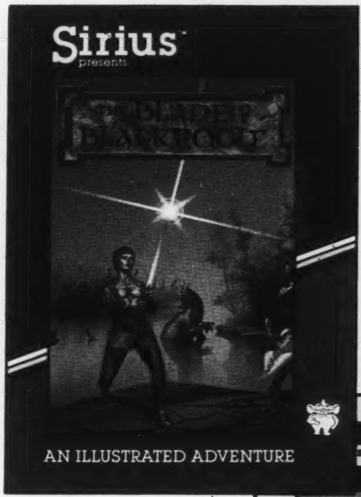
Lowercase

Zardax is supplied with a shift-key modification, though it can use modifications other than the one provided. The furnished mod is unusual because it is a two-wire mod consisting of a DIP header (a plug) prewired to two mini test clips. Rather than sticking a wire end into one pin of the gameport socket, a circuit chip is removed from the motherboard, the adapter is plugged into the vacated socket, and the chip is reinstalled into the adapter. The wires connect to two pins of the keyboard "outrigger" on the newer Apples. No soldering is involved; the mini test clips can be attached and removed leaving no evidence of tampering to void the system warranty.

Another nice feature is that *Zardax* supports all operations of Videx Enhancer II, including upper- and lowercase shifting with the SHIFT key, the type-ahead buffer, and both the auto-repeat and fast-repeat keys. This is the only word processor in this article that supports the Enhancer II completely, others ignore that board except for the type-ahead buffer and the auto- and fast-repeat operations.

The modification is simple, requiring that a patching software disk be obtained from the supplier and used to modify the *Zardax* distribution disk. However, the mod is not reversible. Once made, you cannot run the software without the Enhancer II installed. Therefore, it is advisable to modify only one of the two distribution disks, leaving the other ready for use in case there is a failure in the keyboard.

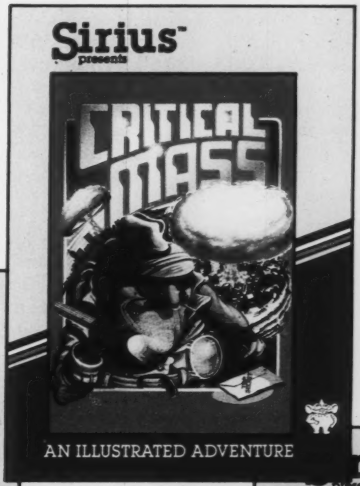
For Heroes Only!



Blade of Blackpoole

Step back in time and join the search for the magical sword of Myraglym. Travel cautiously on your journey for you will encounter dangerous serpents, spine-chilling evils and carnivorous plants that crave human flesh!

Avail. on disk for the Apple II, II+ or IIe and Atari 800 or 1200 and Commodore 64.



Critical Mass

On Jan. 1st at 10:00 am, the U.N. received this message: "Good Morning, in exactly 9 days, the world's 5 largest cities will be destroyed by thermal nuclear weapons." At 10:03 am, you received this assignment: STOP . . . THIS . . . LUNATIC!

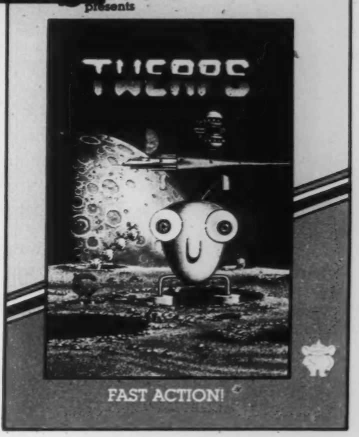
Avail. on disk for the Apple II, II+ or IIe and Atari 800 or 1200 and Commodore 64.

TYPE ATTACK
FAST ACTION TYPING ARCADE

Type Attack

The planet Lexicon is under attack! Letters of the alphabet are falling from the sky. To repel them, you must be able to type the letters faster than they can fall. Be quick! An entire civilization is depending on your skill.

Avail. on disk for the Apple II, II+ or IIe and Atari 800 or 1200, IBM-PC and Commodore 64 and on cartridge for the VIC-20.



Twerps

The boldest space rescue ever! Defenseless Twerps are stranded on an asteroid. You, Captain Twerp, are to board a Twerpcraft, blast through the Orbiters, land safely and rescue your comrades. Beware of the Glingas and Twerp-eating Gleepnites!

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For Your Atari 800 or 1200, Apple II, II+ or IIe, Commodore 64, VIC-20 and IBM-PC

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CIRCLE 266 ON READER SERVICE CARD

Drawbacks

I could find little to complain about with this package. Naturally, it is not perfect, and there are a few picky little items that bother me, but nothing really major. As I have pointed out, it has a great many features and is easy to learn—an admirable combination.

I did find it a little slow for extensive editing because it only provides cursor movement up or down by one line at a time and left or right by one character at a time. The REPEAT key speeds the process, but I still like to be able to jump by whole words, paragraphs, blocks, and pages.

In linking text files together at printout, I found that page numbering could be continuous from one to the next, but I couldn't find a way to make defined page headings and footings carry over from file to file. This can be an annoyance because you must redefine and turn the headings and footings on for each text file of a long document—even when they remain unchanged.

One other notable omission is that *Zardax* does not support hyphenation or syllabication. As far as I have been able to determine, there is no way to insert so-called "soft" or "phantom" hyphens that are printed only when they occur at the end of a line. Therefore, there is no way to "pack" justified text to minimize the spacing spread between words, and there is no way to achieve "tight-ragged" right margins in which lines all end within a spread of a few spaces.

As a final note, *Zardax* does support one special feature of importance in technical and scientific work, namely the nonexpandable nonbreakable space. That is a feature usually omitted because programmers discount its importance. It may not sound like much, but most technical or scientific work requires that certain items not be split between two lines.

Examples are numbers and units of measurement such as 10 kg, where the 10 and the kg must be kept together. Other examples include international standard metric numbering which dictates that commas not be used in multidigit numbers and that spaces be used as digit separators. A number like 59,000 would be written as 59 000, and an ordinary space could be expanded to several spaces during formatting or would allow the 59 on one line and 000 on another. The nonbreak space prevents those things and is, in my mind and for my applications, a critical consideration.

All things considered, *Zardax* leaves me favorably impressed. I can end a day's work with it feeling that I have completed a worthwhile amount of work without hassles or excessive maneuvering to get around software limitations.

Apple Writer II

Apple Computer, Inc., markets a medium-price word processor known as *Apple Writer II.* This word processor has many useful features but is one with which I have developed a love-hate relationship. At any time, I either like or dislike its particular way of doing things. I do have to acknowledge that the occasional irritations are largely matters of personal preference and may or may not affect other users.

There is no question that *Apple Writer II* is a capable word processor, although some of its features are comparatively difficult to understand and apply. For many users, its main advantage is that it runs on a minimum configuration Apple without the extra cost of special hardware support. The program requires 48K RAM and one or more disk drives. It is capable of supporting an 80-column board, but Apple specifically calls for a Sup'R'Terminal (M&R Enterprises). It also works with a Videoterm, but only when a separate "preloader" is purchased for $11 from Videx. I haven't tested this program with any other 80-column boards, so I can't say whether they work and must advise caution in choosing a board for *Apple Writer II.*

This package does not support plug-in RAM cards or keyboard enhancers, so there is no advantage to adding extra memory. However, there may be some advantage to using a device like the Videx Enhancer II, even though the program won't recognize the shift-key wire.

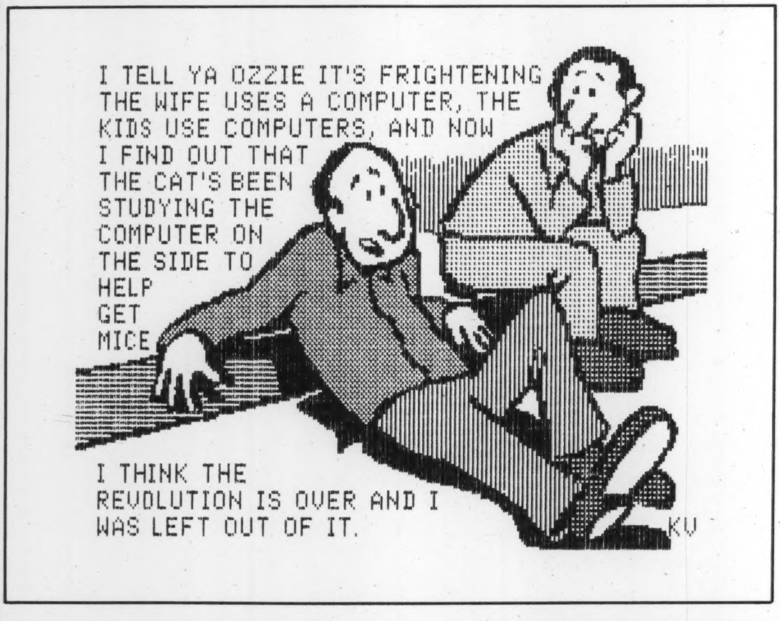
The benefit results from the fact that the type-ahead buffer, auto-repeat, and fast-repeat functions of the enhancer do work. Incidentally, the package does not include the shift-key mod, nor does the instruction manual tell you how to install it. Apple only tells you to take the unit to a dealer—they obviously don't encourage such modifications.

Documentation

I feel *Apple Writer II* is one of the more difficult word processors to use well, despite its on-screen help messages. The manual attempts to move from simple to complex operations, but is neither wholly tutorial nor wholly reference oriented. Information tends to be scattered throughout the manual which does not have an index to ease the task of locating specific items.

For the novice, processing text is confused somewhat by the introduction of a special language called a word processing language or WPL. While the WPL provides interesting capabilities such as printing form letters, merging names and addresses, and "boilerplating" text from standard files, it makes it necessary to undertake programming that users might consider undesirable.

There is a matter of philosophy involved, with two common views of what a word processor is and what it should do. On one hand, some users insist a word processor should be simple to use, without special procedures or programming considerations. Such software is readily accepted in office environments where nontechnical personnel must produce documents without delays or extensive training.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I THINK THE REVOLUTION IS OVER AND I WAS LEFT OUT OF IT.
KV

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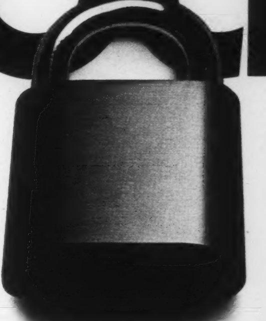

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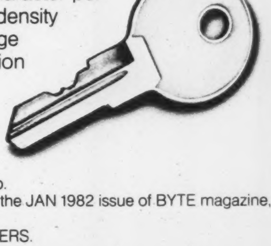

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Word Processors, continued...

The other view is that the word processor can be as complicated as necessary if it achieves the desired purposes, relying on the user to put forth enough effort to use the software properly. *Apple Writer II* seems to be closer to the second philosophy than the first, and the WPL features with their associated programming do impose a requirement for study and experimentation beyond that of other programs.

Another potential difficulty is that text must be printed from memory rather than from a disk file. This means text must be loaded into memory, with any file merges, before an on-screen preview or hard-copy printout can be obtained. As far as I have been able to determine, there is a practical limit of about nine single-spaced pages of text that can be held in memory at any time, with elaborate procedures having to be established for sequentially loading and printing long documents.

creative computing
SOFTWARE PROFILE

Name: Apple Writer II

Type: Word processor

System: Apple II 48K

Format: Disk

Language: Hybrid

Summary: Solid, but missing some features.

Price: $150

Manufacturer:

Apple Computer
20525 Mariani Ave.
Cupertino, CA 95014

Features Missing

Other things of interest to some users are missing, at least without some creative manipulations with the WPL. Among these are:

- Block copying. Apparently copying must be done by sequential deletions and retrievals.
- Deletion of a specifically marked text block. It is possible to delete characters, words, parts of paragraphs, or whole paragraphs, but not larger multi-paragraph blocks.
- Overwriting existing text. All changes are made by inserting new text and deleting old text, not by overlaying or overwriting the original.
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placement, and similar formatted appearances is provided, but there is no unformatted draft copy or storing of a formatted text file to disk for later printing or data transmission.

- Justifying text for a flush right margin is limited to inserting whole spaces between words. The program does not provide microspace justification in which spaces are spread in small increments throughout the line. When the printer (typically a letter quality printer) supports such spacing, microspace justification would enhance the appearance of the page.

Still, *Apple Writer II* does not have features and functions not found in the majority of other word processors. The most notable is split-screen editing that allows two sections of a document to be viewed and manipulated at the same time. This is handy when copying or moving text from one location to another and for checking what has been written without leaving the current editing position.

Apple Writer II also has a facility for recovering or "yanking back" a deletion, useful for moving and copying text and in restoring something that may have been deleted by accident. With most other processors, deleting text is absolute and final. *Apple Writer II* also provides a means for using standard Apple DOS commands, allowing manipulation of disk files without leaving the processor.

Summary

Overall, *Apple Writer II* is useful and effective as long as its limitations are recognized. It is a solid program for anyone wishing to devote time and effort to learning to use it for generating "normal" documents such as letters, reports, and similar materials. Yet it is not quite a "maximum feature" word processor and can be difficult to apply to long documents such as book manuscripts or to materials such as technical or scientific manuals requiring extensive formatting techniques.

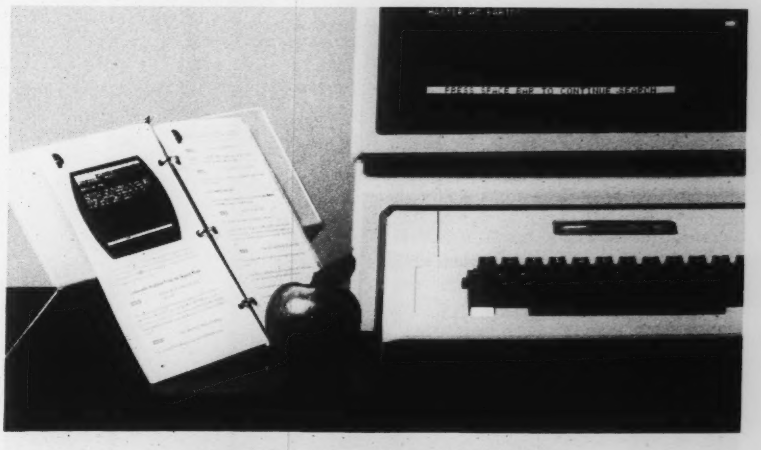
If you need features such as a split screen or the ability to retrieve deletions, it is one of the few choices open to you without acquiring a different computer system or modifying the Apple II to run CP/M-based word processors.

ScreenWriter II

On-Line Systems' *ScreenWriter II* is a rework and rerelease of *SuperScribe II*. This new version has been enhanced and revised, and the documentation rewritten. In its new form, *ScreenWriter II* consists of three word processors within the same program. The supplier calls them the Basic Editor, Creative Editor, and Compleat Editor. These aren't three programs but rather three methods of using the same program. With these distinctions, the user can choose the operating level best suited to an application, using basic operations for simple documents like letters and adding more advanced functions as the complexity of the work increases.

Table 1 shows that *ScreenWriter II* has the largest set of features and functions among the processors represented. Yet the table doesn't show all the features available—only the most common ones. I have found no other Apple word processor that approaches *ScreenWriter II* in terms of the number of different things done with keyboard commands.

ScreenWriter II even provides a means of creating alphabetized document indexes and tables of contents, based on entries flagged within the text itself. The only other word processor providing any form of indexing is *Exec-*



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utive Secretary, and that one doesn't work from items in the text.

ScreenWriter II also provides a means of placing footnotes at the bottom of pages, though the use of this feature is subject to some limitations and restrictions. It does not, however, number the footnotes or position the footnote references in the main text—those remain manual operations.

Hardware

This word processor cannot be used with an 80-column board. Instead, it simulates a wide-screen display, allowing a choice of line lengths from 10 to 70 columns and then adjusting the display to larger characters for 40 columns or less or to small graphics characters to more than 40 columns. However, the compressed type for wide displays is difficult to read on a conventional television or color monitor. If you plan to do a great deal of word processing and want to use the compressed form regularly, you would be well advised to purchase a monochrome monitor for readability. Yet even with a monochrome monitor, the compressed form can be fatiguing to read, and it is virtually impossible to distinguish between certain letters like M and N at a quick glance.

ScreenWriter II runs on a minimum configuration Apple, but that is not the most effective way to use the program. First, a single-drive system limits the things you can do, making it difficult or impossible to save and recover file segments, save and load "macros" that redefine keystrokes, create alternate backup copies of long files, or perform certain other operations. For the best utilization of this package, you should have two drives.

Second, *ScreenWriter II* does support added 16K RAM cards (64K total memory). It is not a requirement, but the added memory allows both the editing and printing programs to be loaded at the same time. Without the card, going from the editor to the printer and back again costs valuable time for loading programs as they are needed. With the card, moving from one to the other is almost instantaneous.

Third, *ScreenWriter II* functions best with a buffered keyboard. If a board like the Videx Enhancer II is installed, the upper- and lowercase shift-key operation won't be supported (a single-wire shift-key mod must be installed), but the type-ahead buffer, auto-repeat, and fast-repeat will prove usable and valuable.

Drawbacks

My principal criticism of *ScreenWriter II* is that it is slow. Many of its operations are time consuming and inhibit a fast typist. While entering text, it is easy to "overtype" the program and lose characters. I have timed my typing rate on this processor and compared it with the 80 to 90 words a minute I can reach with some programs. With *ScreenWriter II* and no keyboard buffer, I start to lose characters when I reach speeds of 30 to 40 words a minute.

The problem of lost characters becomes acute when attempting to insert new text within the body of a document, especially when using compressed screen displays. There is a considerable slowdown as all following characters are repositioned each time a new character is typed. Even with an Enhancer II installed, I can type an entire paragraph in the time it takes *ScreenWriter II* to insert the first three or four words, and I then have to sit back for a minute or two and allow the program to catch up with the buffer.

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SOFTWARE PROFILE

Name: Screenwriter II

Type: Word processor

System: Apple II 48K

Format: Disk

Language: Machine

Summary: More features for the price than anybody else, but slow.

Price: $130

Manufacturer:

Sierra On-Line
Sierra On-Line Building
Coarsegold, CA 93614

To prevent lost characters, a type-ahead buffer is almost mandatory. At least, text can be typed in bursts at normal typing speed, but there is no way around having to allow the program to catch up after typing a sentence or two. But that is still better than having to slow down the typing speed while watching the screen for missing characters.

ScreenWriter II is also slow in loading and saving disk files. It works with a large virtual memory, which is a disk file that handles text in excess of what can be held within RAM. The longer the text being entered or manipulated, the more time is needed to manage the virtual memory during loads and saves.

To illustrate, I set up 11 pages of single-spaced text. Loading the file for editing took 52.2 seconds (read time only). Saving the file took 44.3 seconds to clean up the virtual memory file plus an additional 72.3 seconds to save it once it had been cleaned up.

There was an interesting program interaction I discovered by accident. In playing around with a package called *Bag of Tricks* from Quality Software, I decided to try their initialization routines on a *ScreenWriter II* data disk.

I won't go into details about the procedure except to say that they provide a routine to "reskew" the sectors of a disk. Quality Software claims that reskewing yields a speed advantage for loading and saving programs but not for text files. Nevertheless, I found that reskewing from the standard Apple 2-descending to a 9-descending pattern did speed the disk operations for *ScreenWriter II.* In fact, it resulted in a 31.6% time reduction for reading a text file, a 49.8% reduction for cleaning up the virtual file, and a 42.6% reduction for writing the final file.

A similar interaction occurred in reskewing data disks for the *Zardax* program—16.7% reduction for loading and a 43.8% reduction for saving. However, it didn't work with the Sof/Sys *Executive Secretary,* and there caused an overall slowdown of 3% to 8%.

Another trouble spot was the *ScreenWriter II* method of hyphenation. While manual or automatic hyphenation is an important feature, this program implements it in such a way that it isn't practical for long documents. There are two methods of placing hyphens. One is to insert "soft" hyphens in the text while writing or editing, but that is not practical because there is no way of telling where line breaks are going to occur without printing the document. Soft hyphens could be inserted by a global search and replace in most or all words exceeding a certain character count, but that is far too time consuming to be worthwhile. *ScreenWriter II* does allow interactive hyphenation at printout but has no memory for hyphens, so the same word may have to be hyphenated again and again throughout a single long document or during each printout of multiple copies. Therefore, hyphenation is practical only for short text requiring few copies.

Once again, users must make some careful choices. In the case of *ScreenWriter II,* it is necessary to choose between the convenience of particular features and the disadvantage of slow speed. When maximum editing and formatting capabilities are needed and speed can be sacrificed, *ScreenWriter II* is a good choice, but when the application is time sensitive, say in a busy office, the delays and slowdowns may be prohibitive.

This is not one of the most user-friendly word processors I have encountered. The division into three

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separate styles of processing helps but doesn't eliminate the burden of careful study and experimentation to determine what can or cannot be done. I did observe that the documentation was thorough and detailed, providing all information necessary to implement the functions. The instructions are thoroughly indexed, making it easy to find pertinent descriptions, and they are organized to strike a compromise between a tutorial and a reference manual.

Summary

If it weren't for problems with speed and with the hyphenation feature, I would have no qualms about recommending this package unconditionally. I like the variety of functions and find most of *ScreenWriter II* directly applicable to the bulk of my work. I like features such as indexing and footnoting, being able to recover deleted material (accidental or otherwise), the ability to save and load parts of a document, the ability to save and load parts of a document, the ability to spool a printout for simultaneous editing and printing, and many of the other functions available. But I do feel that *ScreenWriter II* results in an overall loss of time compared with other processors, so I reserve it for applications that must have one or more of the specific functions. It is certainly not a word processor that can be dismissed out of hand, and everyone should consider it seriously and compare it carefully with other packages before making a final decision.

Executive Secretary and Personal Secretary

Sof/Sys, Inc., markets two word processors, *The Executive Secretary* and *The Personal Secretary*. When the editors of *Creative Computing* asked me to do this article, they requested only that I include *Personal Secretary*. But that word processor is a scaled down version of *Executive Secretary*, and is best described by comparison.

The two are at opposite ends of a scale ranging from simple personal uses to major business applications, with *Personal Secretary* at the low end and *Executive Secretary* at the high end. Where most software developers begin with the simpler version and expand it to a complex program, Sof/Sys went the opposite way. They started with *Executive Secretary* and stripped out functions to arrive at *Personal Secretary*. Thus, the simpler program retains many features of the complex one, without the oversights and omissions common to packages developed in the simple-to-complex order.

There are some crucial differences extending beyond the prices of $99.95 for *Personal Secretary*, and $250 for *Executive Secretary*. Those the supplier mentions are that *Personal Secretary* omits the electronic mail and alphabetical indexing of *Executive Secretary*. Furthermore, *Personal Secretary* has a limited electronic card file (a rudimentary database) handling a maximum of 299 cards or records per file with up to seven fields per card. Meanwhile, *Executive Secretary* handles up to 999 cards per file with a maximum of 13 fields per card.

Hardware

But differences don't stop there. *Executive Secretary* supports 80-column boards including Full-View 80, Videoterm, SmartTerm, Vision-80, and Sup'R'Terminal, as well as a 40-column display with a lowercase adapter. *Personal Secretary* works only with a 40-column display and lowercase adapter chip (Sof/Sys provides one with *Personal Secretary* but not with *Executive Secretary*).

I tried to force *Personal Secretary* into 80-column mode by activating the board

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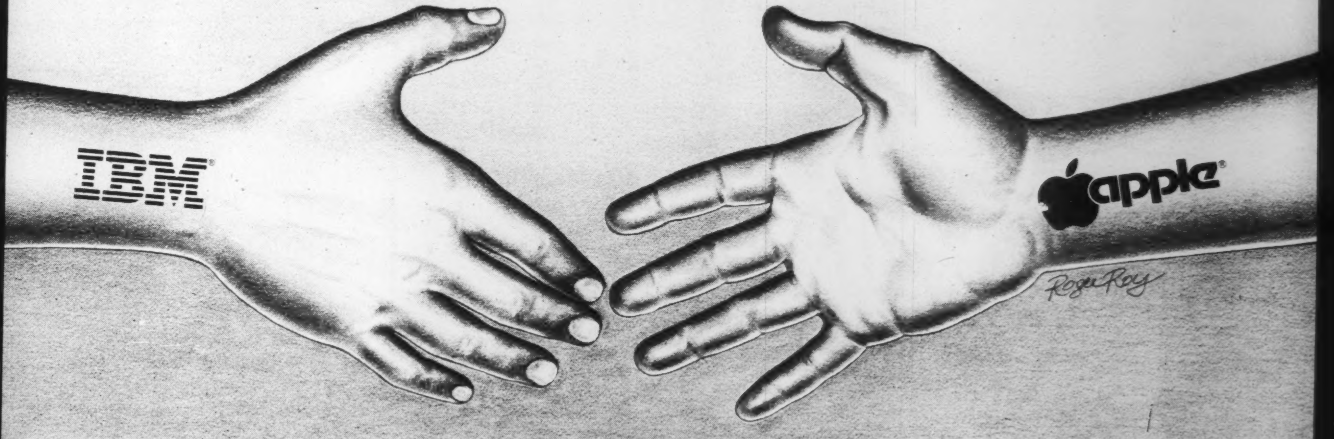

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Table 1. Word processors and their features.

Feature or Function	Zardax	Apple Writer II	Screen Writer II	Executive Secretary	Personal Secretary
Cursor Movement and Scrolling					
Move cursor by character	X	X	X	X	X
Move cursor by word	–	–	X	X	X
Move cursor by line	X	X	X	X	X
Move cursor by sentence	–	–	–	–	–
Move cursor by paragraph	–	–	–	–	–
Move cursor by block (fixed or predefined)	X	X	X	–	–
Move cursor by tab settings	X	X	X	X	X
Move cursor to beginning of text	X	X	X	–	–
Move cursor to end of text	X	X	X	–	–
Move cursor to user-set position marker	–	–	–	–	–
Scroll screen by line without moving cursor	–	–	–	–	–
Scroll screen by page	–	–	X	X	X
Split-screen operation	–	X	–	–	–
Text Insertion and Deletion					
Insert text (nondestructive insertion)	X	X	X	X	X
Change text (destructive overwriting)	–	–	X	–	–
Delete single characters	X	X	X	X	X
Delete whole words	–	X	X	X	X
Delete partial line (e.g. cursor to end)	–	–	X	–	–
Delete one entire line	–	–	X	X	X
Delete to end of sentence	–	–	–	–	–
Delete to end of paragraph	X	X	–	–	–
Delete entire page	–	–	–	–	–
Delete a marked area	X	–	X	X	X
Delete entire text (delete all)	X	X	X	–	–
Recover deletions (buffer or "yank back")	–	X	X	–	–
Block Operations and Manipulations					
Copy block (original left intact)	X	–	X	X	X
Move block (original deleted)	X	X	X	X	X
Save or load block to or from disk	–	X	X	X	–
Find and Replace Functions					
Find specified string (search only)	X	X	X	X	X
Find and replace string (single occurrence)	X	X	X	X	X
Global find and replace	X	X	X	X	–
Find and replace with user verification	X	X	X	X	–
Specified matching in finds (e.g. case)	–	–	X	–	–
Disk-File Handling					
Save or load entire text or file	X	X	X	X	X
Save or load partial text or file ("block")	–	X	X	X	–
Merge files while editing	X	X	X	X	–
Uses standard Apple DOS	X	X	X	X	X
Requires special handling to convert files	–	–	–	X	X
Provides direct access to DOS commands	–	X	X	–	–
Page Formatting Features					
Single-line page headings	X	X	X	X	–
Single-line page footings	X	X	X	–	–
Multi-line page headings	X	–	X	X	–
Multi-line page footings	X	–	X	–	–
Automatic page numbering	X	X	X	X	X
Odd/even page distinctions	X	–	–	X	–
Unconditionally force a new page	X	X	X	X	X
Conditionally force a new page	X	X	X	X	–

Feature or Function	Zardax	Apple Writer II	Screen Writer II	Executive Secretary	Personal Secretary
Line and Paragraph Control					
Right justification by whole spaces	X	X	X	X	X
Microspace justification (if printer allows)	X	–	X	X	–
Centering lines	X	X	X	X	X
Ragged left/justified right lines	X	X	X	–	–
Automatic paragraph first-line indent	–	–	X	–	–
Automatic paragraph spacing	–	–	X	–	–
Non-break or "phantom" space	X	–	–	X	–
Automatic or assisted hyphenation	–	–	X	–	–
Manual hyphenation ("soft" or "phantom")	–	–	X	X	X
Adjustable line spacing (double space, etc.)	X	X	X	X	X
Type Control (when printer allows)					
Underlining	X	X	X	X	X
Bold face	X	–	X	*	*
Superscripts	X	X	X	*	*
Subscripts	X	X	X	*	*
Proportional spacing (non-justified)	–	–	X	–	–
*denotes a feature available through a user-defined function.					
Printer and Printout Control					
Formatted printing (hard copy)	X	X	X	X	X
Literal printing (draft copy)	X	–	–	X	X
Simultaneous printing and editing (spooling)	–	–	X	–	–
Formatted output to disk	X	–	X	–	–
On-screen preview of formatted text	X	X	X	X	X
Sequential printing of multiple files	X	X	X	X	X
Interrupt/resume printout	X	X	X	X	X
Print continuous pages (no pauses)	X	X	X	X	X
Print single pages (pause between each)	X	X	X	X	X
Select starting and ending pages	X	X	X	X	X
Print multiple copies	X	–	X	X	–
Accept control characters in text	X	X	X	X	X
Special or Convenience Features					
Set up a "glossary" of predefined keys	X	X	X	–	–
Provides on-screen "help" messages	–	X	X	–	–
Incorporates mailing-list features	X	X	X	X	X
Provides index preparation features	–	–	X	X	–
Provides table-of-contents preparation	–	–	X	–	–
Provides footnote placement features	–	X	X	–	–
Special Hardware Considerations					
Supports shift-key modification	X	X	X	X	X
Supports 80-column board	X	X	–	X	–
Supports compressed type without hardware	–	–	X	–	–
Supports full Videx Enhancer II installation	X	–	–	–	–
Supports 16K RAM card or language card	X	–	X	–	–

Table 2. Comparative ratings by category.

Category and Scale Ends	Zardax	Apple Writer II	Screen Writer II	Executive Secretary	Personal Secretary
Ease of learning (1=easiest; 5=hardest)	1	4	5	3	2
Ease of use (1=easiest; 5=hardest)	1	5	3	4	2
Total number of useful features (1=most; 5=fewest)	2	4	1	3	5
Special features (1=most; 5=fewest)	3	2	1	4	5
Short document handling (1=most suitable)	2	4	5	3	1
Long document handling (1=most suitable)	3	4	1	2	5
Overall versatility (1=most; 5=least)	4	3	1	2	5

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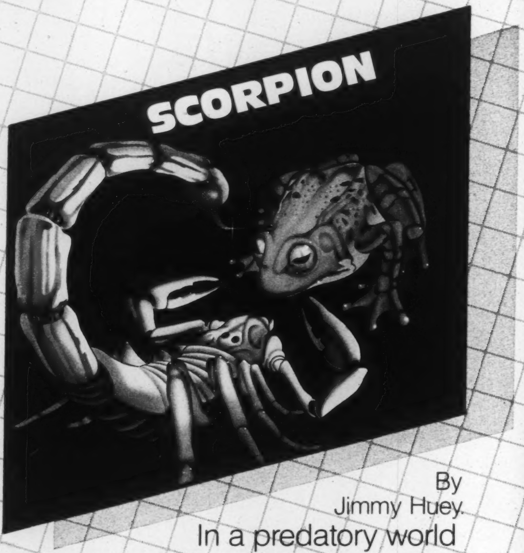

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Jimmy Huey.

In a predatory world of killer worms, dragons, stalkers, pods and fly traps, the scorpion prowls the maze in search of sustenance. Frogs and their eggs mean survival to the scorpion. But they can also mean instant death! (Suggested retail $39.95)

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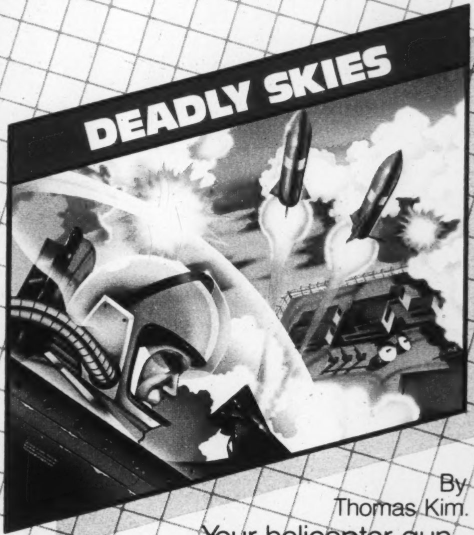

By
Thomas Kim.

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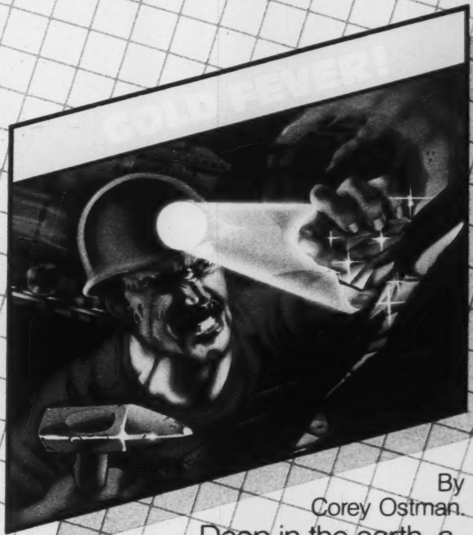

By
Corey Ostman.

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CIRCLE 289 ON READER SERVICE CARD

before entering the processor, but the results weren't satisfactory. Menus and operating instructions were not cleared completely from the screen between functions, and the useability declined.

Both *Executive* and *Personal Secretary* are supplied with single-wire shift-key modifications, including a mini test clip on one end of the wire. This solderless mod requires only that one end of the wire be inserted into gameport socket pin 4, while the other clips onto the keyboard outrigger. This eliminates the danger of damaging equipment by soldering and leaves no evidence of tampering that might void the hardware warranty.

creative computing

SOFTWARE PROFILE

Name: Executive Secretary

Type: Word processing and merge/mail programs

System: Apple II 48K

Format: Disk

Language: Machine

Summary: Editing, card file, and electronic mail features standard.

Price: $250

Manufacturer:

Sof/Sys
4306 Upton Ave. S.
Minneapolis, MN 55410

Operationally, the editing, disk handling, and printing functions of *Executive Secretary* and *Personal Secretary* are similar. They enter text, move the cursor, delete text, save and retrieve whole text files, and generally work in the same way. However, *Executive Secretary* can save, retrieve, and link subfiles (portions of larger text), while *Personal Secretary* cannot.

Furthermore, *Executive Secretary* supports global (repeated) search and replace operations, header lines, microspace justification, conditional paging according to lines remaining, and a direct tie-in to the Sof/Sys *Executive Speller,* none of which are available in *Personal Secretary.*

Special Functions

Executive Secretary provides special functions for printing on preprinted forms missing from *Personal Secretary.* Several conditional printing commands of *Executive Secretary* also were deleted for *Personal Secretary,* as well as some of the commands for merging card files into final documents. However, some caution is needed in assuming what is or is not available in *Personal Secretary.*

I found several items, particularly embedded print-time formatting commands used in *Executive Secretary,* that worked in *Personal Secretary* but were not documented therein. Among these were forcing a new page unconditionally, inserting syllabication for "soft" or "phantom" hyphens, and several other features that make *Personal Secretary* more capable than the instructions indicate.

I even stumbled across an *Executive Secretary* function that worked in my copy of *Personal Secretary* even though the supplier insists it shouldn't, namely a command to widen "binding edge" margins of alternate pages. The command worked in my version, but I was told it shouldn't and would be disabled in later releases. I can only hope that Sof/Sys takes time to update their *Personal Secretary* manual before many more incomplete or erroneous copies are released.

Considering only *Executive Secretary,* the user has access to a capable and well coordinated processor that includes index alphabetizing, card file maintenance and merging, electronic mail features, and other special functions. The program was comparatively easy to use, while being capable of meeting normal formatting requirements.

However, moving into *Executive Secretary* from some other word processor requires some readjustment. There are some things that this package doesn't do quite the way other packages do. For example, while editing, moving the cursor down a line from the bottom of a page or up from the top doesn't bring new information onto the screen. Instead, it jumps to the top or bottom of the existing screen. Bringing up new text requires a separate "paging" command. Similarly, moving the cursor past either end of a line doesn't move up or down a line—it merely jumps to the opposite end of the same line. These actions may be disturbing at first, but they are matters of personal preference and can be used to good advantage.

Alphabetical indexing with *Executive Secretary,* is a sorting feature and can be used as such without actual indexing. The index file is created by typing the entries from the keyboard, not by flagging the items in the text. That file is then sorted and printed in index form. Whether the approach is an advantage or disadvantage depends on the type of document involved. For books, where indexing is done after the material has been typeset and returned in "page proofs," there is little gain from flagging the text files, because changes between manuscript and finished pages often negate any time saving. For manuals and other documents output by the processor in camera-ready form, it would be preferable to flag the text and have page numbering done automatically.

Card File

I did encounter some problems with the electronic card file. First, the program occasionally goes out to lunch for 10 seconds or so during typing of an entry. It looks like a Basic language pause for a string space cleanup. Without a buffered keyboard, characters are lost and entries must be retyped. Even with a buffered keyboard, uppercase letters are converted to lowercase during the pause, and some retyping is still necessary. My other objection is that only one of the card lines can be searched or sorted in one pass. Sorting on two or more lines requires two or more passes through sequentially developed "indexes."

I prefer the ability to sort and search for several items simultaneously.

Overall, both *Executive Secretary* and *Personal Secretary* are competent word processors, but not for the same applications. I reserve the inexpensive *Personal Secretary* for purely personal documents requiring few fancy operations or formats. I choose *Executive Secretary* for business-oriented operations like mass mailings, formal reports, manuals, and manuscripts.

creative computing

SOFTWARE PROFILE

Name: Personal Secretary

Type: Word processor

System: Apple II 48K

Format: Disk

Language: Machine

Summary: Competent for personal documents.

Price: $100

Manufacturer:

Sof/Sys
4306 Upton Ave. S.
Minneapolis, MN 55410

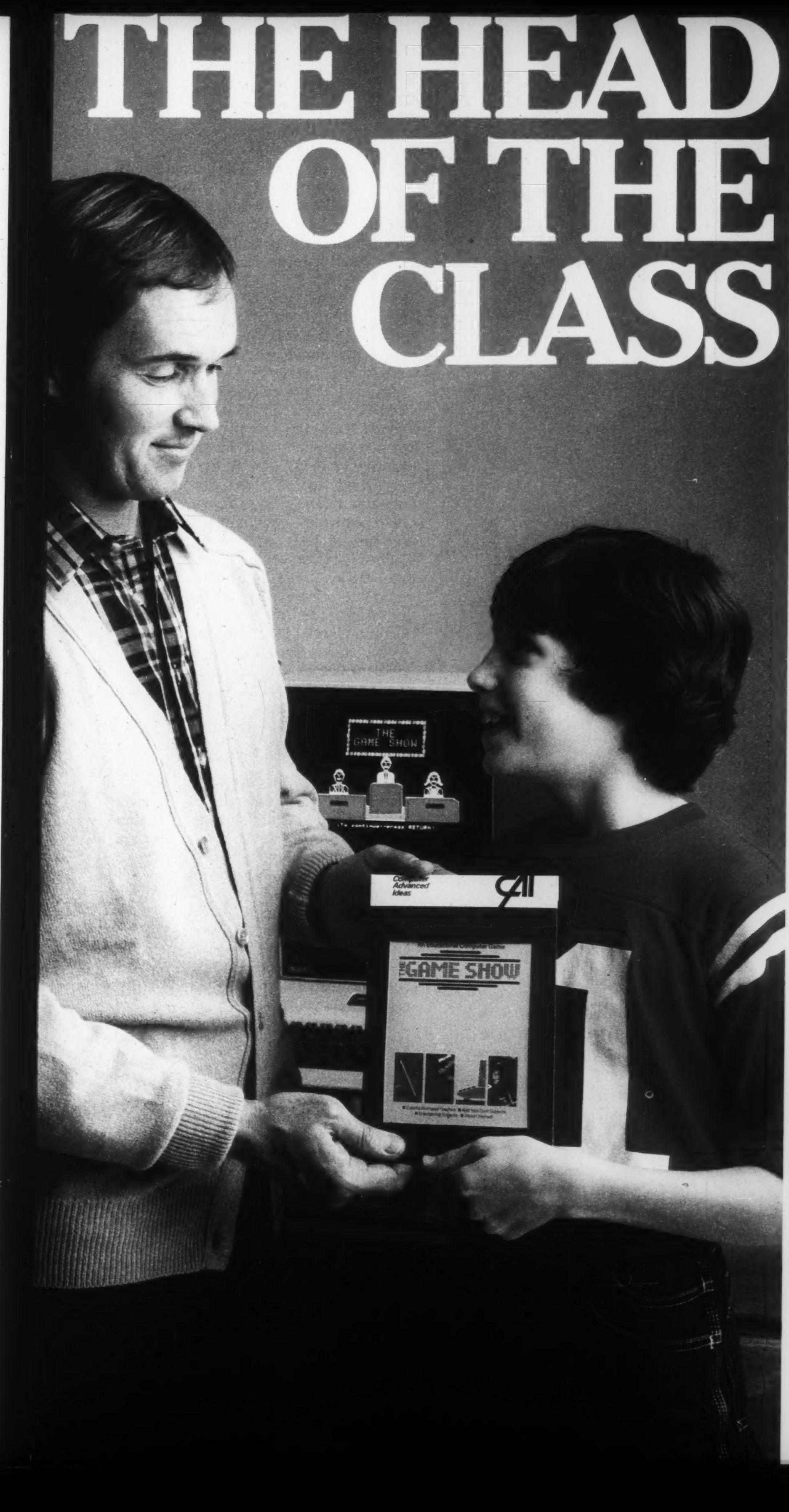
Making Your Own Selections

This article has become longer than I intended as I have tried to do justice to five word processors. Even so, space restricts the presentation and forces me to ignore or skim over desirable and undesirable features in each package. As the end user, you must perform your own evaluations in the context of what you expect from a word processor. I have merely tried to point out some advantages and disadvantages to get you started.

In selecting any processor, there are things you should not do:

1. Don't buy a processor "blind." Know all you can about the package be-

THE HEAD OF THE CLASS



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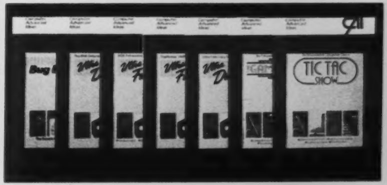

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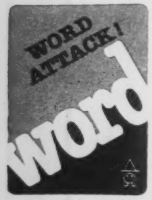

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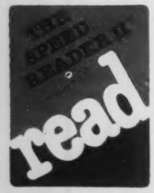

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Word Processors, continued...

fore putting your money on the counter. One of the worst mistakes you can make is taking on a word processor without trying it out.

2. Don't rely on sales demonstrations. Most demo programs and presentations show only the best features. Remember, the retailer has to buy the package, so sales personnel may concentrate on trying to resell it regardless of a customer's needs.

3. Don't rely on advertising claims. There is an art to promoting the good and hiding the bad, and many advertisers aren't above padding claims and stretching points.

4. Don't rely totally on published reviews. No reviewer is completely unbiased, and few publishers want to alienate suppliers and advertisers with negative reviews.

5. Don't accept other people's opinions too quickly. Word processing involves personal taste, and what you like may not be what someone else likes.

Those are some things you should not do. Here are some things you should do:

1. Determine exactly what capabilities you need. Identify your "worst case" document styles and formats, and design a test document that includes every problem you expect to encounter.

2. Survey the field. Go through current magazines and find several packages that look good based on advertising, product releases, and reviews.

3. Visit your retailer and ask for demonstrations of each package selected as a possibility. The demos quickly identify the best points.

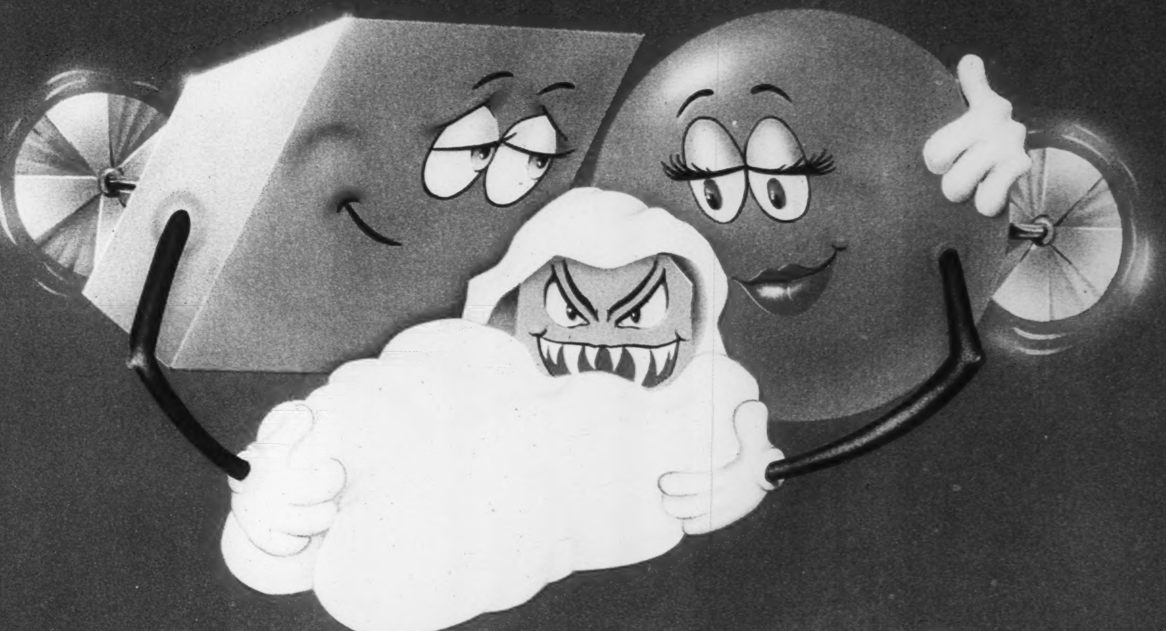
4. Insist on "hands-on" experience before you buy. Take time to use the word processors to generate a suitable copy of your test document. Don't let sales personnel rush or pressure you, and make sure you have enough time to test every needed function and feature. If the retailer balks, take your business elsewhere.

5. If necessary, buy time at a computer learning center in your area, but first make sure they have the hardware systems you are seeking and the programs you need to try.

6. If you are buying a word processor for use by someone else such as a secretary or typist, be aware of that individual's likes, dislikes, and preferences. It does no good to buy a processor to improve your work output if the person running it can't or won't use it effectively.

In short, proceed cautiously. The time you spend evaluating the word processor could save a great deal of money and time and many headaches later when you have to use the system you have selected. □

When these aliens get personal—



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Bank Street Writer

John J. Anderson

Many of you out there in microland have already grown to know and love at least one word processor in your lives. You know, then, that a relationship with a word processor is an experience not unlike a torrid human relationship—with its ups and downs, satisfactions, peeves, elations and disappointments. In many instances, the finality is a break-up, often resulting from the user having become fed up or having found "something better." I myself recently went through the strain of a change in word processors, and believe me, there were some tense moments.

> ***The selection of a word processor is an extremely personal transaction, a marriage of sorts.***

My feeling toward old document disks is akin to the feeling one might have toward "old flames." Those disks just won't work on any current system. And yet there is a lingering and undeniable attachment to the spurned, older formats. Some of the best text of our lives resides there, you know.

Till Crash Do You Part

Similarly, the selection of a word processor is an extremely personal transaction, a marriage of sorts. In all honesty, I have recently shied away from reviewing word processors for that very reason. In this arena, one man's meat is truly the other man's poison. I have found things that drive me mad about one system that seem to pose no problem to other users.

Conversely, features I find easy to deal with others will tell me are impossible to tolerate. It is enough to render one silent on the topic.

One thing I will readily acknowledge is how pivotally my own writing depends on the process of processing words. I was given the popular label of "underachiever" at more than one point in my early school days, which meant that I was bright but applied myself only to things in which I was interested—I didn't have much patience for things of a previous moment when my attention had passed to the next. This is surely a poor trait for a writer, though it is often a prevailing one.

Writing, Rewriting, and Kids

Sure, brainstorming can be quite a bit of fun; it is the thinking part of creative writing. But *revision* is the backbone of coherent writing. I am not speaking here of proofreading and necessary correction of typographical errors. I am speaking of revision. Without revision, the Declaration of Independence would lack its crystalline inspiration ("we think these facts are obvious"). Without revision, Tolstoy would probably read like an ad in the subway.

Now let's bring kids into the equation. Being the underachiever that I was (and probably still am), whatever flair I had for writing was always tinged by my disdain for rewriting. This drag lowered my academic coefficient on all but those papers I cared about passionately enough to actually examine closely and rework. Merely having a typewriter was no help at all. And I know I was not alone in this dilemma. Many of my compatriots had even worse habits. It was a shame. And it need not happen to my kids.

We now know, of course, that a good word processor makes revision a snap, a pleasure, an obvious component to the writing process. It is a truth we hold to be self-evident.

In the world of word processing today, however, things are rarely easy. With the exception of a very few systems such as Apple's mouse-based *Lisa Write,* a word processor is going to take substantial time to learn. On the average, I'd guess it takes about 10 hours to begin feeling confident with a given system.

Then there are those systems that seem to require extra user appendages (such as noses) to complete cryptic command codes—the user-hostile category, you might say. What about John Q. Public? How about a word processor for him? How about something that a third-grader can learn and love? If I had had access to a simple, easy to learn, but powerful word processor when I was in third grade, I might have been President by now.

It is of major importance, therefore, to bring word processing to kids in an accessible way. It can revolutionize their entire outlook concerning the sphere of

creative computing
SOFTWARE PROFILE

Name: Bank Street Writer
Type: Word processor
System: 48K Apple II, Atari, other systems soon.
Format: Disk
Language: Machine
Summary: A must if you have a micro and kids.
Price: $69.95
Manufacturer:
Broderbund Software
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Number of Codes	1	63
Automatic Transactions Number	25	900
Frequency	Once a month	Unlimited
Double Entry	NO	YES
Accounting Background Required	NO	NO
Accommodates Any Type Transaction	NO	YES
Transaction Retrieval	One at a time	Screen at a time
Backdate Transactions	NO	YES
Ability to Interrupt While Printing	SOMETIMES	ALWAYS
132 COL PRINTER REQUIRED	YES	NO
NUMERIC FORMATTING	292661	292.661.42
Optional VisiCalc Interface	NO	YES
PERFORMANCE*		
Startup to Transaction Entry	113 sec	44 sec
Begin Printing Balance Sheet After Entering Transactions	162 sec	1 sec
Begin Printing Transactions After Entering Transactions	106 sec	2 sec
RATING		
Peeling II evaluation	C/D	A
PRICE		
APPLE II/IIe Personal Version	$75	$129
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Bank Street Writer, continued...

reading and writing. It can show them that expressing themselves clearly and well is not only possible, but rewarding.

But what are we to do? Teach seven-year-olds to use *WordStar*? That's simply not feasible. Fortunately, another package has recently appeared; it is so simple, accessible, forthright, and consistent, that kids are begging to write "What I Did on my Summer Vacation" on it, even in the off-season. It is *Bank Street Writer,* from Broderbund Software.

Developed in conjunction with a research and design team from the Bank Street College of Education in Chicago, *Bank Street Writer* was designed to embody the word *simplicity,* and it does so quite admirably. Selecting from screen-based menus with the keys <, >, and the spacebar, the user chooses whether to enter or correct, manipulate, delete or save text.

And although it has been designed for ease of use by children, *Bank Street Writer* is quite capable of producing professional results with any short document. I wouldn't want to use it for a novel, but for ten- or twelve-page reports, it does just fine. Up to 2300 words can be stored in any single text file. Of course, files can be linked, so that larger documents can be stored.

Without revision, Tolstoy would probably read like an ad in the subway.

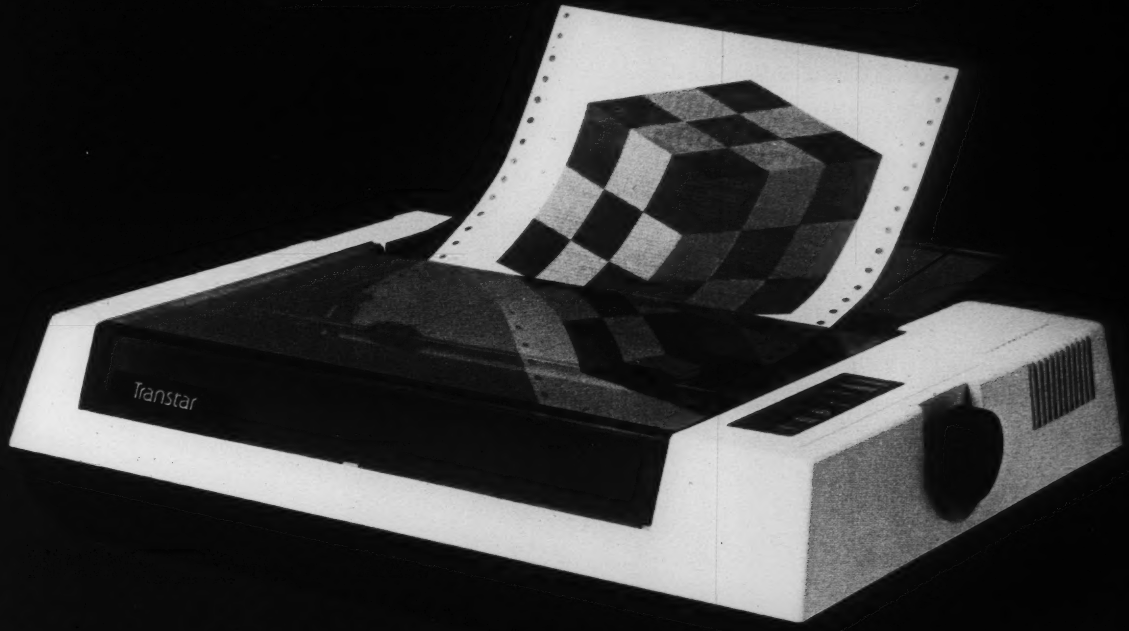
The top of the *Bank Street Writer* screen always displays the choices which are available to the user. Among these are options to delete or undelete, move blocks of text, find and replace character strings, save, kill, rename, or print files. All of these modes can be selected straightforwardly by moving the highlighted bar to the desired choice, then hitting RETURN. It is that simple, and it becomes second nature very quickly.

Below the menu bars is a text box, in which your text appears. Entering text is as simple as, well, entering text. Full cursor control is available using the arrow keys on the Atari, and the I, J, K, and M keys on the Apple. Lowercase is generated through software in the Apple version.

Special cursor control keys are also provided, to move to the beginning or to the end of a text file, or in jumps of 12 lines in either direction.

In addition, other keys allow for

Color for the Price
of Black and White



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SOFTALK

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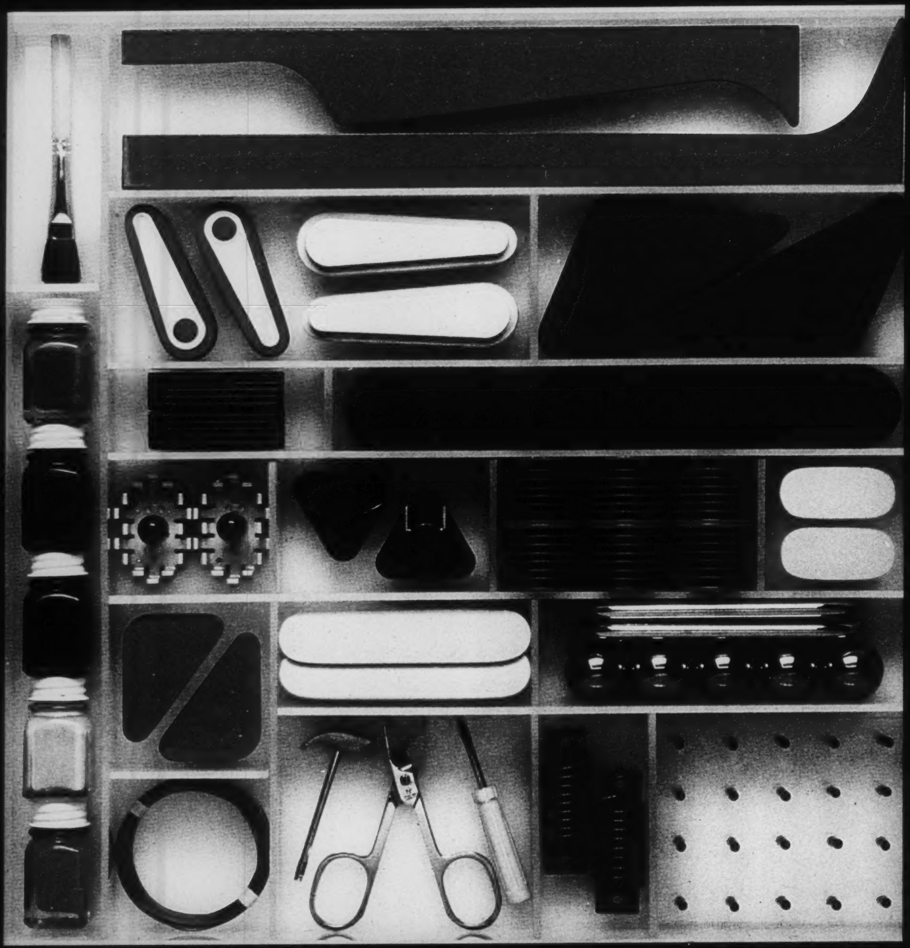

BudgeCo announces The Pinball Construction Set, the first entertainment software that has the simplicity and freedom of interaction of a toy. You don't use this program—you play with it.

The Pinball Construction Set allows you to build your own video pinball games by providing a library of conventional (and unconventional) pinball pieces and a set of video tools.

Use the video hand to put library pieces on the game board—as many as you want, where you want them.

Use the polygon tools to make borders and obstacles. Add game logic and scoring rules with the wiring kit.

Create hi-res designs and logos using the BudgeCo magnifier and paintbrush.

Change gravity, time, elasticity and bumper strength.

Load and save designs to/from disk.

Available for the Apple II®
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Bank Street Writer, continued...

centering of lines and indenting of paragraphs, and indicate how much RAM storage space remains. You can even protect personal files with a password, so that others will not be able to access them from *Bank Street Writer.* (Because text resides in conventional DOS files, however, it is not *too* secure, and perhaps that is good, because kids have a way of forgetting passwords.)

Let's take a closer look at the estimable friendliness of the program.

I have decided, for an example, to move a block of text from one place to another. How to do it? First I move the selector on the top menu portion of the screen to "move." I do that using the <, >, or spacebar. Then I press RETURN. I have now entered the move screen. It prompts me to place the cursor at the beginning of the text to be moved. I do so, then press RETURN again. The move menu prompts me to move the cursor to the end of the block to be moved. I do so, and the text that will be moved is immediately highlighted. The screen prompts me to hit RETURN. I do so, and am prompted to move the cursor to the desired location of the transplanted text block. I do so, then hit RETURN. The text is moved there, and I am asked, "Is it OK to move text here?" If I say no, it will put everything back the way it was. If I say yes, it will effect the move. Even then, I can put things back by using "moveback." Now that's friendly.

If you hold down ESCAPE while the program is loading, the utility program will boot up instead of the word processor. Through this, special disk drive or printer configurations can be custom-tailored. Even optional keyclick is offered, though I can't imagine why you would want it.

Documents can be printed in draft or in final format. In draft format, the document prints out precisely as it appears on the screen, so that corrections can be entered easily and located. In the final print format, the user is guided through a series of questions that will determine the shape of the printout. Here it is determined how many characters will be printed to a line (40 to 126, with a default to 65), along with line spacing, chaining, truncation, and page previewing parameters. A short header line is available, as is page numbering.

Indicative of the friendliness of the package is the polished, five-lesson tutorial that appears on the flip side of the disk. It takes the user painlessly through entering text, cursor movement, erasure and "unerasure," text movement and "moveback," and find and replace functions. The lessons are interactive, and offer to send you back for extra help if you are having difficulty following the instructions.

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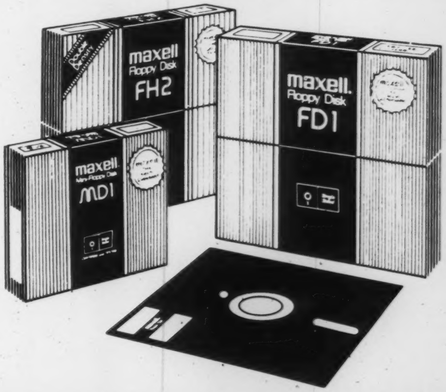

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Bank Street Writer, continued...

The tutorial is well-constructed and handsome to watch. Although it does not render the manual dispensable, it certainly does clearly cover the basic aspects of the program by walking the user through certain operations. I wish we could see more on-line helps of this caliber.

Token Picky Criticism

Unfortunately, the quiz bits of the tutorial are slightly unforgiving, demanding *exact* compliance with questions in order to advance. I included a period in a certain text alteration and incurred its wrath. It took me a while to figure out the mistake, because I am a dummy. The manual, on the other hand, is utterly unflawed, even for the likes of me.

> ***I cannot think of any features I would demand from a $70 word processor that are missing from this package.***

I cannot think of any features I would demand from a $70 word processor that are missing from this package. Actually, a few features could have been omitted from *Bank Street Writer*, like the fine tutorial, and $70 would still be a bargain. If we were to name a category "low-end, easy-to-learn word processors with 40-column or less display," and identified a real need to bring the power of word processing to the student, housewife, and John Q. Public, it wouldn't take long to reach the conclusion that *Bank Street Writer* is the leader of the pack. For the Atari machine, which has until now lacked an easy system, the product is surely a relief. In fact, according to Broderbund, Atari has chosen it for use in its own summer camp program.

Teach Your Children Well

Working with the product is a pleasure, and if that pleasure rubs off on *your* kids, they will undoubtedly do better in school. I remember two-finger typing the wrong letter sometimes in my first writings as a babe, then feverishly straining to alter my sentence to fit the typo. Childish indeed, but to my mind, too much of today's world runs in just that way—bending the intention to match the error. It is a priceless lesson to teach your children otherwise—and *Bank Street Writer* presents an invaluable tool with which to do so. □

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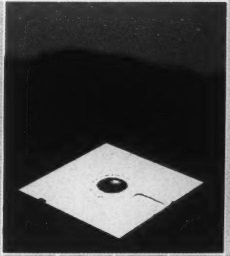

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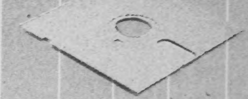

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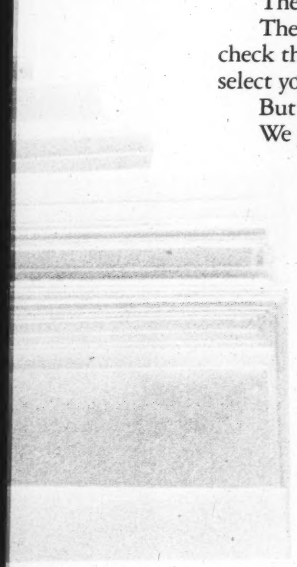

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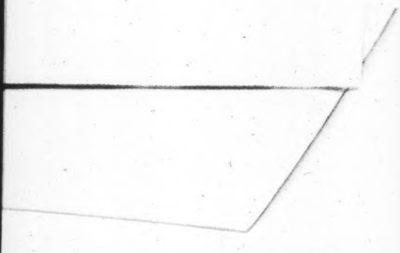

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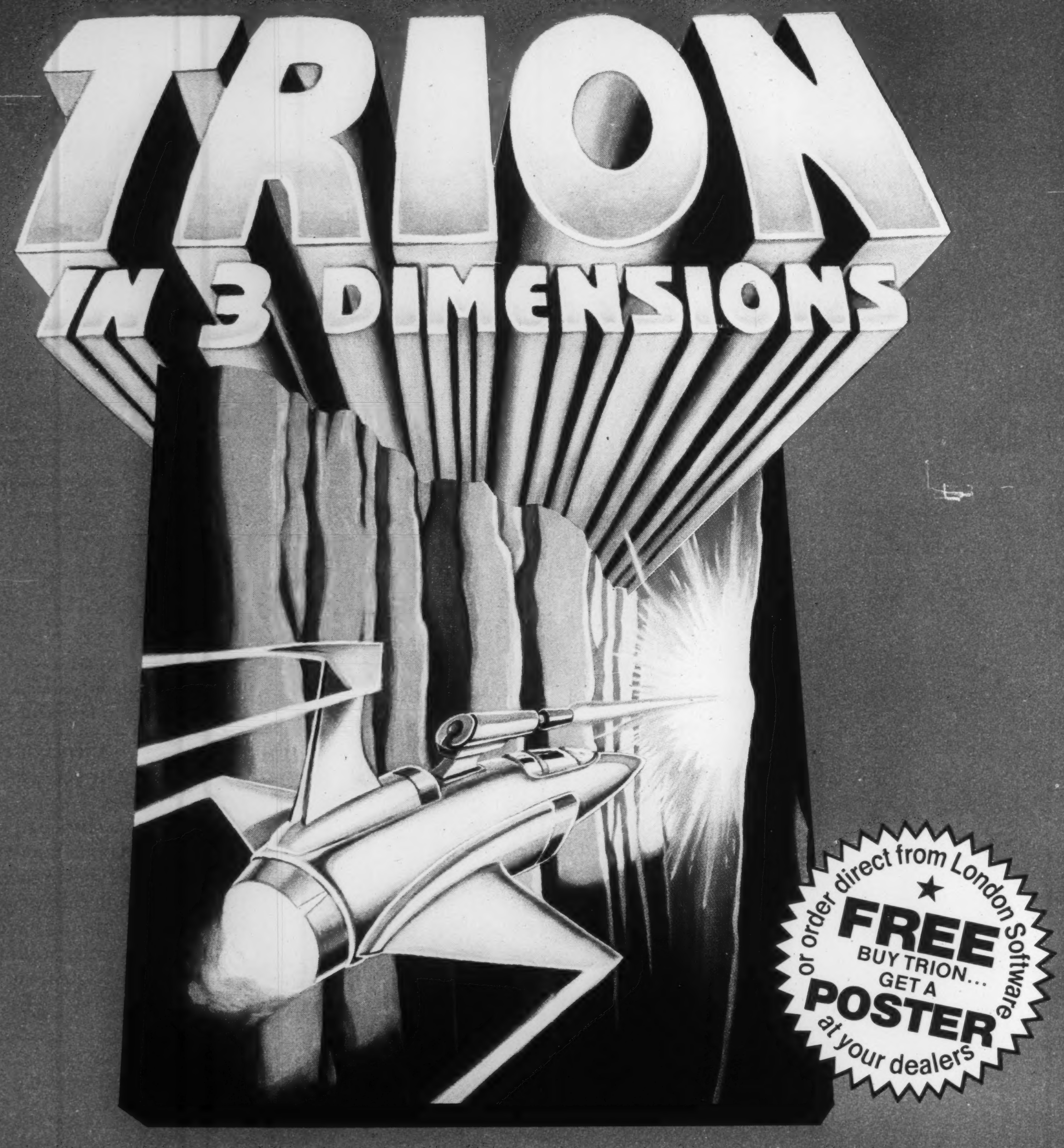

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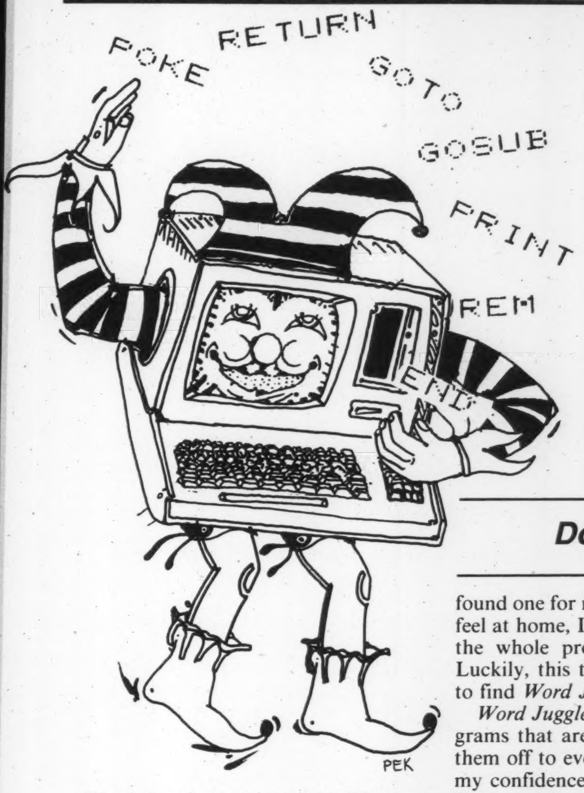

Word Juggler

Doug Ford

Word Juggler is an Apple III word processor that stays out of your way as much as possible. It stands out because of its completeness and ease of use.

My first word processor was like a suit that was about a size too small. I was always uncomfortable with it. It always made me feel a little uneasy, irritated me, made me want to get up from the Apple and go somewhere else.

It was designed to accommodate the way computers work, not the way humans work.

Even something as simple as setting margins was a complex process that required frequent use of a poorly done reference book. Commands were remarkably hard to memorize—the keystrokes and command names never seemed to relate to the functions they were supposed to control. The whole thing was overly mechanical, more of a puzzle than a tool.

That first program, and many of the ones that came after it, seemed to have been designed by someone who didn't have the faintest notion how real people would want to use it or how the program could make their work easier and more comfortable.

Useful, well thought out word processors exist, of course, but about the time I found one for my Apple II that made me feel at home, I bought an Apple III, and the whole process started over again. Luckily, this time it didn't take as long to find *Word Juggler.*

Word Juggler is one of those rare programs that are so good I want to show them off to everyone I know. It bolsters my confidence in the software industry. It is complete and well written, but best of all, it is designed to accommodate human beings.

The program takes advantage of the Apple III redefinable keyboard. The keys on the keypad provide single-stroke editor commands (like find, delete character, delete line, and so forth). The top row of the keyboard provides a complete repertoire of margin, indent, and spacing commands, as well as a long list of other formatting features.

Flexible label strips come with the program to identify the keys. The labels make it simple to use program functions, but I would hate to try to memorize the commands without them.

creative computing

SOFTWARE PROFILE

Name: Word Juggler 2.3
Type: Word processor
System: 128K Apple III, monitor, printer, extra drive (floppy or hard disk)
Format: Disk
Language: Assembly
Summary: First rate, complete humanized
Price: $295
Manufacturer:
Quark Engineering
1433 Williams, 1102.
Denver, CO 80218.

The instruction book is complete and well designed. There is a section on installation, a tutorial, a command reference chapter, and a section on data file merging. Five well-marked appendices provide advanced information on backup, file formats, errors (and how to recover from them), a glossary, and that all-too-rare item, an index. We might wish for typesetting in future editions, but why quibble?

Word Juggler works best with a two-drive Apple III (or with a hard disk), but it can be used with a single drive system.

All the program options are numbered and labeled on the Main Menu. You make selections by typing the corresponding number, typing the name of the command (Store), or just the first letter of the command. Pressing only RETURN puts you in the type and edit mode. The ENTER key on the keypad always bring you back to the menu.

Entering Text

To begin a new document, select the New menu option, which clears the screen and places the blinking cursor in the upper left. An inverse line at the bottom always shows the name of the file (if it has a name), the line and character the cursor is on, and the number of free lines still available. (You have over 800 80-character screen lines to work with on a 128K Apple, and nearly 1800 lines on a 256K machine.)

The keyboard is always live; all you need to do is start typing. When the time comes for corrections, the four direction arrows move the cursor to any point in the text. To insert, just type; to delete, use the relabeled minus key on the lower left of the keypad.

Word Juggler provides single keystroke commands to delete words, lines, and paragraphs, as well as very smooth routines that manipulate large chunks of text, to store, move, copy, delete, or reinsert them.

Doug Ford, 3418 Emerson Ave. S. 306, Minneapolis MN 55408.

One of the advantages of word processing is the ability of the computer to find particular words or phrases for you, and to change them on command. With *Word Juggler,* both the find and the change commands are controlled by single keystrokes. You have more change options than usual with this program, including the choice of searching or replacing throughout the text, or just from the cursor position. You can also select whether changes will be done automatically, or one at a time under your supervision.

Printing

Print formatting commands are on the top row of the main keyboard. All print formatting commands begin with the ESCAPE key, then one of the number keys, sometimes with the addition of SHIFT or CONTROL keys. There are single command keys for each of the usual components of page layout: centering, justification, margins, spacing, page length, pause for single sheet loading, and new page.

So much for mundane items. The list of special features is long and ranges from the nice to the genuinely special (outstanding?)—and most are available as labeled, single key commands.

Single, double, and triple spacing are available in a keystroke, as is a software controlled switch from 10 to 12 to 15 characters per inch if you have a printer that can make use of it.

Word Juggler includes a Need command that lets you print groups of lines together, so your title doesn't appear at the bottom of one page and the associated text at the top of the next.

> ***The list of special features is long and ranges from the nice to the genuinely special.***

Another good feature not included on many word processors is a command for ragged left, which justifies the right margin and lets the left fall where it may—a technique often used for captions and labels.

If you have an NEC, Qume, or Diablo printer, or one of their electronic act-alikes, you can use superscripts, subscripts, and incremental spacing, a printing technique that gives you straight left and right margins by slightly varying the distance between the letters on each line. *Word Juggler* also provides special handling for Epson printers, including easy font changes, underlining, double strike, and italics.

Many word processors allow only one line of header or footer information. *Word Juggler* lets you specify up to ten lines of headers and footers, and alter them from within your document. Unfortunately, there is no provision for automatic footnotes.

Other Features

One of the most useful features of the program is its Display Document command. Pressing the decimal point on the keypad instantly provides a fully formatted screen representation of your document, and sideways scrolling lets you see the whole thing, even if you have specified lines that are 254 characters across.

A Display Document command that allows such wide lines is especially useful when you want to preview the effects of merging other files, such as *VisiCalc* spreadsheets, into your documents, and you can sort them before printing. A set of If commands is available if you want to filter out particular records from your data file, or conditionally print portions

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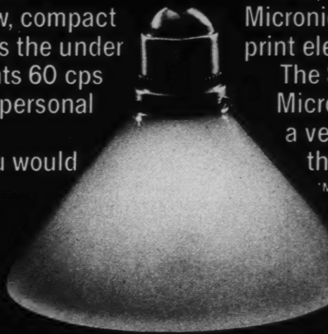

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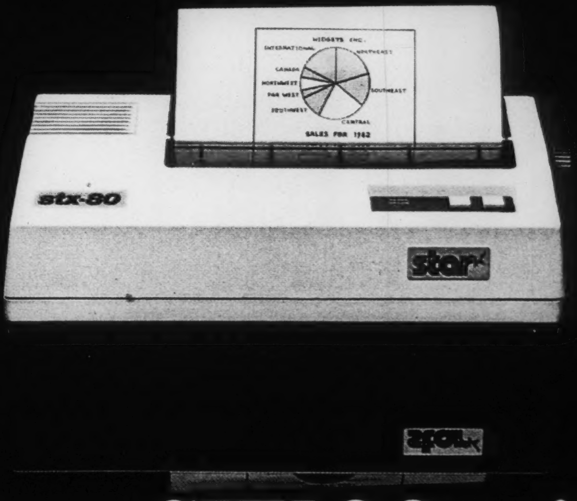

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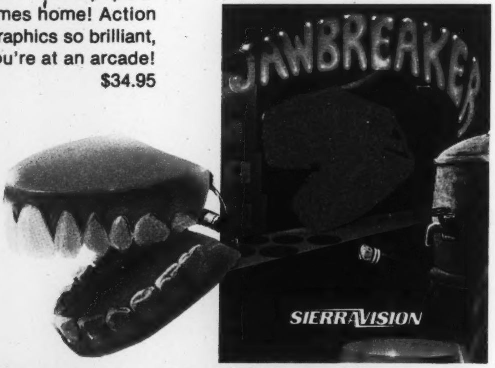

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of a document. For large lists, an optional ($35) utility program that merges files from Apple's *Mail List Manager* is available.

Another item you can purchase separately is *Lexicheck,* a fast, smooth, modifiable spelling checker whose only drawback is that it retails for $195. *Lexicheck* actually works from within the *Word Juggler* program, so you don't have to stop editing to verify your spelling. When *Lexicheck* is finished examining your text, it returns to the typing mode, ready to continue editing. An additional $85 buys *Legal Dictionary,* an extension to the *Lexicheck* program that adds 8000 legal terms to the basic 30,000-word *Lexicheck* dictionary.

The Drawbacks

Word Juggler has a few drawbacks, too. For instance, those command templates are a wonderful idea, and avoid the problems associated with memorizing commands—until you lose one of them, as I did on the first day I had the program, or until you move to another Apple III. I ended up making a card with all the commands and carrying it right with the disk until I actually did learn the commands I use most. I recommend that you make paper copies of it if you plan to use more than one machine.

(Losing that template had a good side to it, too. When I called Quark Engineering I got an immediate, knowledgeable, genial response, and a new set of templates in the mail about three days later.)

> **Should you want to switch your Epson to graphics mode to drop in a Greek letter, you're out of luck.**

The templates don't show all the available commands. Where many keys have three meanings, the templates indicate two at most, and some keys are left completely unidentified. A template showing everything would have been pretty messy, I suspect, but some of the unidentified keys perform important functions such as block move and copy.

It is possible to send special commands to your printer, but they affect an entire line at a time. Should you want to switch your Epson to graphics mode to drop in a Greek letter, you're out of luck.

I have found only one real irritation in the operation of the program. Suppose you want to break a paragraph into two smaller ones. To tab the text of the second part for a paragraph indentation, you need a three-key combination: the CONTROL key, the SHIFT key, and the TAB key. In an otherwise streamlined, efficient, professional program, an operation that cumbersome is glaringly out of place. It doesn't seem at all unreasonable to expect the tab key to work on its own.

But it has been a long time since I found a business program with only one functional flaw. This one was done right. The menu is there when you want it; your text is never more than a keystroke away; commands are spread out before you on the keyboard; and disk access delays are kept to a minimum. The program never hesitates; and it requires very little memorization. It works the way humans work.

Word Juggler is complete, fast, easy to learn, and comfortable to work with. I hope this kind of quality is the future of micro software. It is a pleasure to use. ☐

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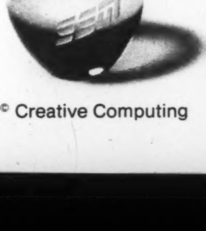

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An Office Word Processor

PowerText

Joseph Devlin

Most word processors are made up of two central components—a text editor and a print formatter. The text editor is the part of the package that allows the writer to change, move, insert, delete, and otherwise play with the text of a document that appears on his screen. The print formatter is the part of the package that prepares the document for printing.

In some word processors, the print formatter and the text editor are closely integrated so that what you see on the screen resembles what the printer will print. In packages which do not integrate text editing and print formatting, you can type free form (you do not have to worry about indenting paragraphs, for example), confident that the print formatter will reprocess your text for the printer in the format you intend.

However, what you give up is the ability to see your text on the screen in the format the printer will be using unless you run a separate print-formatting program. When a programmer decides whether or not to integrate text editing and print formatting in his word processor, he determines the appropriateness of his word processor for certain applications. In general, word processors which do not integrate text editing and print formatting are better suited for an office environment. This is true because experienced typists can save time by using free format input, especially if they are accustomed to creating certain standard types of forms.

PowerText is a word processing package that is particularly well tailored for an office environment. In part, this is because it is a combination word processor and style manual. In addition, the care which has gone into enforcing formatting conventions and in designing the menu structure will aid the office employee in using *PowerText* effectively.

The basic premise of *PowerText* is that all the documents issued from a given office should have a standard appearance. One company memo should look like all other company memos. One report should look like all other reports. This saves secretaries and their bosses from wasting time worrying about where to place commas and choosing between "Very truly yours" and "Yours truly."

PowerText allows you to store definitions of letters, memos, reports, shipping orders, and other standard forms. Once the format for a particular type of correspondence has been defined, you need not worry about it again. Margins, tabs, page length, headers, footers, closings, and cover pages are automatically formatted according to preset definitions.

Preparation of a Mask

Let's look at the way *PowerText* creates a letter. The first step is the preparation of a letter format mask. When you design the mask, you decide that the date will be positioned at the top right, the address will be three to four lines long on the left, and the closing will be at the bottom right. Once the mask is prepared describing where all the elements of the letter will appear, you can begin typing the letter.

PowerText identifies and locates the elements of the text you type in by responding to the commands you embed in the text. Type /par and the program knows to begin a new paragraph and indent at this point. Type /date and the following line will be placed on the top right of the page. The end result is that *PowerText* is very good for production of documents in strict, established formats.

The advantage of this is that you can rapidly enter text without having to worry about placement of standard paragraph indentations, salutations, and the like. (You may also set non-routine indents within the document itself.)

PowerText is not so good if the writing you do does not follow standard formats, since the creation of a format is a fairly time-consuming procedure, and that time is wasted if the format is to be used only once.

Menus

The *PowerText* editor makes use of nested menus to reach the various commands. Functions are usually invoked through single keystrokes once they have been located on the proper menu. On each level, only certain functions can be performed. This means, for example, that you must exit the Insert mode to perform most other functions such as saving text

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SOFTWARE PROFILE

Name: PowerText

Type: Word processing package

System: 64K IBM Personal Computer; Apple II & III

Format: Disk

Language: UCSD P-System

Summary: Powerful and complex word processing package tailored for office environments

Price: $399

Manufacturer:

Beaman Porter, Inc.
Pleasant Ridge Rd.
Harrison, NY 10528
(914) 967-3504

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or moving to the top of the file.

Thus, although nested menus are helpful for inexperienced users, they do entail a good deal of overhead. They make performing most of the major editing functions easy, but it can take a while to get to the proper menu for the function you wish to perform.

In each mode in the editor, a prompt line tells you what your most likely options are. You choose each of your actions by depressing a single key. For example, you press I for insert or D for delete. Unfortunately, certain of the more obscure commands are invisible; they are available from certain menus, but are not displayed. Obviously, these commands must be memorized if you plan to employ them regularly.

Another problem is that the same mnemonics have different meanings depending upon which menu you are in. Usually this is a mild annoyance. For example, Q for Quit usually means "go to the primary menu," but in the Edit mode, Quit puts you into a special Edit menu that provides you with other options.

One instance of these multiple-use mnemonics, the use of the escape key, is particularly annoying. Throughout most of the menu system, hitting escape will recall the previous menu. In the Insert mode however, the escape key deletes all text currently being inserted, then exits to the previous menu.

Features

The *PowerText* editor provides the standard screen editing commands along with some rather nice amenities. All of the common word processor editing and printing features such as subscripting and superscripting, bold and wide printing, underlining, block moves, and search and replace are supported. Footnote numbers can be automatically incremented and subscripted.

Other useful features include buffers that allow you to undelete recently deleted text and allow for complex cut and paste operations. The fact that the program automatically creates a differently named backup file will save you much frustration when you accidentally delete major parts of your current opus. A phrase dictionary allows the definition of up to 26 words or phrases.

PowerText formats disks with ten sectors rather than eight, providing additional storage space on the disk. Thus, the standard single sided disk can store 200K rather than 160K per disk and double sided drives can store 400K rather than 320K.

The formatter adds flexibility as well. Form letters can be easily produced, and *PowerText* provides a newspaper style column facility that automatically divides the page into two equal columns. The outline feature will number and indent outline material up to nine levels deep.

It may take a while to create a standard form, but the use of the format results in speedily and correctly printed documents. However, if the standard format is altered, results are less predictable.

You can imbed formatting commands, such as /ind 20I, which indents 20 columns more than the previous indent, free form while in the text editor. However, there is no menu to indicate what format commands are available, and the effect of an imbedded format command can be seen only by quitting the editor, saving the document, then entering the print formatter and calling up the display program. It may take five minutes just to be able to see that an indentation is five spaces too long. If this kind of mistake occurs, the document must be re-edited, then reformatted and examined again.

Documentation

PowerText comes with a thorough, well written manual that would have been much improved if it were better formatted and included an index. The lack of an index is a particular annoyance when trying to remember the commands that do not appear on the menus. Fortunately, Beaman Porter offers a telephone help line manned by friendly experts who can bail you out if you get into trouble.

PowerText has been on the market for the Apple II and III since September of 1981. The version reviewed here is new. It runs on an IBM PC with 64K bytes of memory and two single sided drives. A larger memory and dual sided drives are suggested, however, unless you relish constant disk swapping and like to read out-of-memory messages.

A version of *PowerText* is available for $199 to users who already own the UCSD P-System. This version comes without the UCSD runtime module, editor and file utility that are included in the full package.

A 90-minute audio tape for training in the use of *PowerText* is available for $29.95. Beaman Porter promises to make periodical software updates available for a nominal fee. Users who wish to add spelling checking to the word processor can purchase Beaman Porter's *PowerSpell* for $125.

Summary

PowerText is a comprehensive, full featured word processor that is particularly useful and valuable in offices and other situations in which documents are produced in uniform formats. ☐

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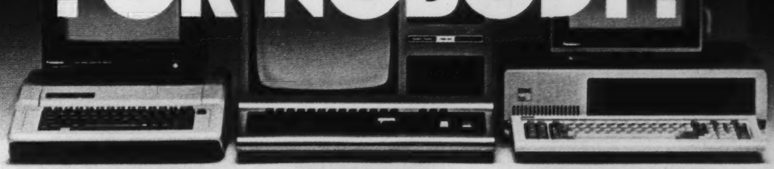

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It's the Commodore 64. We're not talking about a low-priced computer that can barely retain a phone number. We're talking about a memory of 64K. Which means it can perform tasks most other home computers can't. Including some of those that cost a lot more. (Take another look at the three computers above.)

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So while other companies are trying to take advantage of the computer revolution, it seems to us they're really taking advantage of something else:

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*Manufacturers' suggested list prices as of March 20, 1983. Monitor included with TRS-80 III only. Commodore Business Machines, P.O. Box 500R, Conshohocken, PA 19428; Canada–3370 Pharmacy Avenue, Agincourt, Ont., Can. M1W 2K4.

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High-Tech specs. 16-bit microprocessor, 16K bytes RAM (expandable to 52K). 26K bytes internal ROM, up to 30K bytes external ROM. 3 simultaneous tones from 110 HZ to 40,000 HZ. High resolution video. U. & l.c. Single line overlay for 2nd function. Control & function keys. 16 color graphics with 4 modes & sprites.

Sound impressive? Compare a TI Home Computer with the competition and really be impressed. You won't even need a computer to tell you this is the one.

TEXAS INSTRUMENTS

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CIRCLE 293 ON READER SERVICE CARD

Perfect Writer

Bud Stolker

A standard cliche for reviewers of word processing software is to claim that "Soft-Star Super Perfect Word-Master Letter-Writer" (substitute your favorite name) is so easy to learn that "I wrote this review in the first hour I used it." Somehow such claims never ring true. Any word processor sophisticated enough to handle the needs of today's users deserves careful study.

Because Computer Services Corp. of America states in its full-page display ads that its *Perfect Writer* is simple enough for unskilled users, I had hoped to learn it quickly. I wanted to exercise my imperative as a reviewer to use the software to write this evaluation. After all, I can turn a cliche with the best of them. It automatically footnotes; I wanted to provide you with some pithy postscripts. It can format verse; I wanted to paeon *Perfect-Writer* poetically.

Alas, it was not to be. Though *Perfect Writer* is easy enough to learn, mastery requires considerable time and practice. Installing the program on your computer can be difficult. For my machine it was impossible. While ultimately I found *Perfect Writer* to be a superb work, the finest total microcomputer software package I have yet encountered, I cannot recommend it without several strong reservations.

Advanced Features

At the outset let me say that I am impressed. This is a significant product—a major achievement in microcomputer software. The advanced features of *Perfect Writer* belie its modest price. For $289 you get a well integrated series of programs that incorporates an editor, draft printer, fancy print formatter, and a set of configuration programs that fit the programs to any large-scale CP/M-compatible computer. You get a series of lesson files, some for beginners and some for advanced users, that set a standard of excellence other software authors would be wise to study. A padded silk-screened binder with integral pocket encloses a 325-page typeset user's manual and a separate, illustrated command summary printed on sturdy card stock.

When the author says the user's guide is free of jargon and arcane "computer-ese," he's not kidding. His step-by-step explanations, supported by dozens of illustrations and diagrams, instruct the user in plain, concise English that makes studying this book a pleasure.

The package includes a document design program that can invoke over 30 predefined formats (business letter salutations, indented quotations, itemized lists, etc.), providing total control over text output, either according to your specifications or its own default instructions. *Perfect Writer* can automatically create a table of contents that lists and numbers chapters, sections and subsections, headings, paragraphs, and appendices. It even includes page numbers in the contents. Further, it can generate an alphabetized index of words and topics, complete with page numbers. It can insert footnotes anywhere in a document that you specify, renumbering them automatically as you add new ones. You can refer to items mentioned previously in the text, and *Perfect Writer* will automatically calculate the page on which they appear, and insert the page reference for you.

All these features are standard equipment. Optional extras for *Perfect Writer* include a spelling checker, a mailing list system, and a file manager that can sort, merge, and extract data in a variety of formats. Each of these additional products is $189.

The company is willing to support its customers and its software, judging by my brief conversations with a support specialist, and in any case offers a money-back guarantee if you are not completely satisfied. What more could you possibly want?

Two things that I want come to mind immediately. One is a computer with enough memory and disk storage to satisfy the need of *Perfect Writer* for lots of room. The other is a dealer or resident technician to install the program on my dream computer. The *Perfect Writer* advertisement does not specify what size machine is required to run this software. Nor was the technician I phoned sure, although he seemed otherwise knowledgeable. As it turned out, my 48K Vector Graphic computer is too small for *Perfect*

creative computing
SOFTWARE PROFILE

Name: Perfect Writer

Type: Word processor

System: CP/M 2.2, 64K RAM,
IBM PC DOS, MS DOS

Format: Disk

Language: Machine language
(written in C)

Summary: Sophisticated system of
integrated programs

Price: $289

Manufacturer:
Computer Services Corp.
of America
1400 Shattuck Ave.
Berkeley, CA 94709
(415) 974-6661

Bud Stolker, Landmark Towers, Apt. 1506, 101 S. Whiting St., Alexandria, VA 22304.

Writer, though the technician claimed to have heard "scattered reports" of 48K machines running the software. A more realistic minimum is a genuine 56K machine (some CP/Ms reclaim several kilobytes for their own use; these won't do) and dual disk drives with at least 150K storage disk—250K per disk is preferable. That is more muscle than my own machine, with a mere 180K of storage on two disk drives, can muster.

Unaware that *Perfect Writer* was too big for my machine, I encountered considerable frustration trying to get the program to run. I wound up using a friend's much larger computer to evaluate *Perfect Writer*. Yet even with Gerry's expertise as a savvy senior software engineer and his intimate knowledge of his own system, we had trouble configuring the software. More on that later.

Comfortable to Use

Within an hour of sitting down at the terminal, I was comfortable with most of the cursor controls. Within five hours I had methodically plowed through the lesson files and tried every command at least once. By the end of a long day I was able to sling text from file to file like a pro. Interestingly, I found two days later that I had forgotten most of the commands—a classic case of too much too soon.

Although the documentation referred to an on-screen help file, none ever appeared. Nor could I find such a file in the disk directory. This was a minor oversight, and presumably by now a "help" command is part of the package. That would be a big help to beginners like me, though using *Perfect Writer* should become second nature with practice. The command structure is logical and consistent. The editor offers satisfactory prompting for the more complex operations, as long as you know how to enter the higher level command modes in the first place.

Popular word processors like *WordStar* and *Electric Pencil* frequently favor a compass arrangement for cursor control: the "east" key moves the cursor right; the "north" key moves the cursor up, and so forth. *Perfect Writer*, on the other hand, assigns the most commonly used instructions mnemonically: control-F for forward one character, control-B for backward. The next higher level of commands employs the same mnemonics, but uses the escape key for so-called "Meta" commands: Escape-F moves the cursor forward one word; escape-B goes back a word. Commands used even less frequently require both an escape and a control character.

In this regard *Perfect Writer* bears a strong resemblance to EMACS, a venerable screen editor developed at MIT in the early 1970's. The EMACS design philosophy has merit even today, despite the extra keystrokes sometimes required. Multiple key commands that broaden the repertoire of available functions adapt well to computers with definable keys. With *Perfect Writer* it is easy to configure any key to deliver any command.

Flexibility and Safety

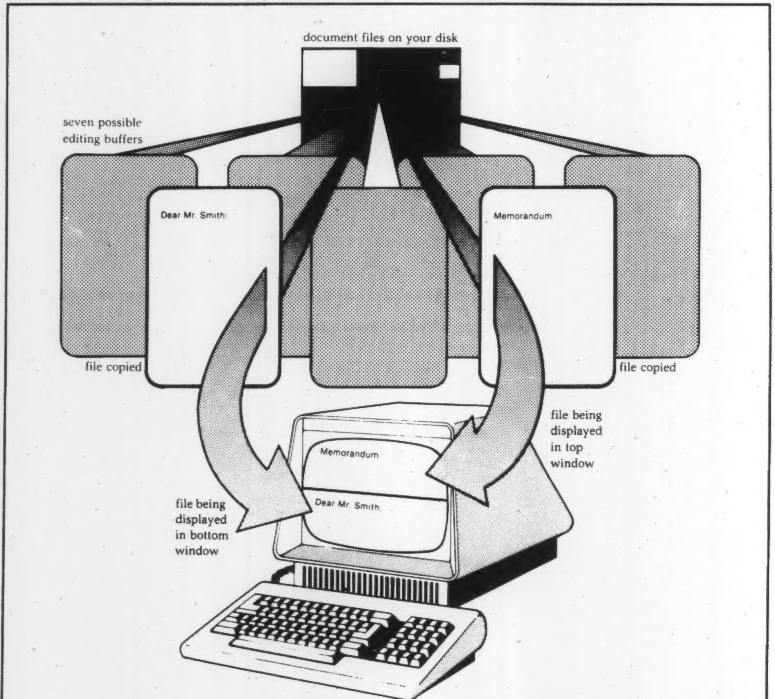
The function- and level-oriented mnemonics, while requiring the user more or less to memorize commands, also provide for greater flexibility and safety. Because less frequently used (and more potentially damaging) commands require a multiple command sequence, you are less likely to blow an entire editing session with an injudicious keystroke. Many is the file I have lost while using *Electric Pencil I* by typing a control-O ("exit to operating system and destroy buffer") at the wrong time. Quitting *Perfect Writer* requires a control-X, control-C; then a final verification that you do, indeed, intend to end the session.

Other control-X sequences signal other major operations, such as opening and closing files, entering and leaving split-screen windows, and moving text between files. You can even lock out the edit commands so that you can review the text without fear of inadvertently changing it.

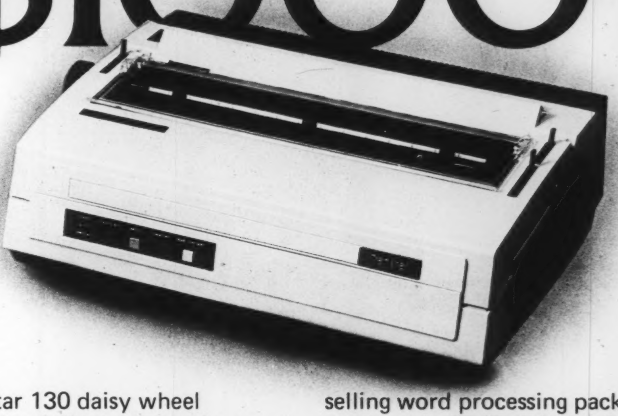
At every critical point, *Perfect Writer* prompts you for verification. The editor reserves two lines at the bottom of the screen for command prompts and status information. With such a sophisticated editor, this feature is not only desirable but necessary. The ability of *Perfect Writer* to manipulate text files is awesome, and it is possible to blunder on a grand scale. The author of the program wisely provides several ways to make a graceful recovery from gross errors, allowing you to recall text that you have deleted, to cancel the last command entered, or if all else fails, to abandon your temporary text buffers and try again with the original files.

When it comes to managing files, *Perfect Writer* takes an unconventional yet elegant approach. A "virtual memory" scheme enables you to work on files larger than the memory capacity of your machine. It simply swaps data between disk and memory when it thinks you are not looking. If you haven't typed anything for several seconds, the editor briefly flashes a "swapping" message and activates the disk drive. While this sounds like a perfect way to lose characters by typing while the disk drive is running, I found that the swap process works very well indeed. Unless you start to type in the split second that the drive first acti-

Console screen provides a separate window on two different documents.


document files on your disk
seven possible editing buffers
Dear Mr. Smith:
Memorandum
file copied
file copied
file being displayed in top window
Memorandum
Dear Mr. Smith
file being displayed in bottom window

Is 42 seconds worth $1000?



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vates, *Perfect Writer* can handle your keystrokes and interleave its own disk file maintenance. Try as I might, I was unable to drop more than a character or two, and even that required fast reflexes. I was working with a fast 8" disk system, however. Swapping could be an annoyance on slower 5-1/4" drives. The delay time between last keystroke and start of disk file maintenance is easily adjustable to suit your preference.

You can access up to seven lengthy text files at a time, and display portions of any two of them in split screen windows whose sizes you can adjust as you move text around. The split screen enables you to move a sentence, or several chapters for that matter, from one file to another. Simply mark the beginning and end of the text, "delete" it into a buffer file, point to the spot in the other file at which you want to insert it, and "yank" it back from the buffer. With paragraphs it is even easier, since *Perfect Writer* recognizes paragraphs as basic units of text. Place the cursor anywhere in the paragraph, and *Perfect Writer* automatically figures out how much text should be moved.

A typical command sequence for moving a paragraph to a different file (escape-H, control-W, control-X, O, control-Y) is straightforward, though it sounds complicated. True, you'd better pay full attention to opening both files, setting up the split screen text window, and marking the appropriate text in both files. But consider the alternatives. You could merge the two files (assuming you had enough working space), delete the excess data, edit and then save an updated file. Or you could extract the information, kill the excess, merge it with the new file, edit and save the new file, and delete what was left from memory. Then you might want to load in the old file, erase the text that you have lifted, and resave that file.

You get the picture. *Perfect Writer* can save a great deal of work. It operates with ease in situations that show up the shortcomings of less powerful software. With a high-capacity disk system, say half a megabyte or more, each of the seven open text files can be larger than 64K, the practical limit of random access memory in 8-bit machines. And you don't need to know or care how the computer manages all that information. Advanced file-handling routines do the work without a crash, without a complaint, without even a dropped character.

Installation A Problem

So why am I so hesitant to recommend *Perfect Writer*? For one thing, it can be difficult or impossible to install without considerable effort and research. For another, its rich command vocabulary makes it more complicated for the casual user than a less flexible word processor. And it works efficiently only on the largest CP/M systems.

Installing the screen editor and file handler can be quite simple if you are using a standard terminal. The chatty and helpful configuration program explains the process, offers a comprehensive list of terminals that it "knows," tests the cursor control features you select, and then sets up a file that takes into account your preference in screen formatting and disk file management.

Gerry and I found a bug in the Heathkit terminal installation. The Heath option that we selected tested out correctly, but when we tried to run the program, the main menu appeared on the screen and immediately erased itself. Because the installation program allows you to edit any command for any terminal, we had no trouble changing "clear screen" to "clear to end of screen." That solved the problem. A user who is not technically oriented might have had trouble, though, since the installation program does not test for this particular feature. It tests for everything else, and therefore can lull you into a false sense of security.

And that's one trouble with *Perfect Writer*. It is advertised as easy to use. The ads say "you're off and running in no time." Not so. You had better know your system—and CP/M—thoroughly before trying to install these programs. Printer configuration is the really hard part. We tried to set up *Perfect Writer* to use Gerry's Spinwriter, one of the standard machines supported by the Perfect Printer module. The first time we tried to bring up the printer, Gerry's Votrax speech synthesizer spoke up instead. Several hours later, after poring through the manual and trying repeatedly to make the Spinwriter print, we gave up for the night.

The following evening we set up the Spinwriter as a "vanilla" printer: one with no underlining, boldfacing, proportional spacing or other fancy features. That made it easy to patch in. The printer worked impressively, even though we were using slow, inefficient, and unsophisticated CP/M printer output routine (the "list device"). The *Perfect Writer* print module gave us several unexpected features in this mode. It was smart enough to back over text and retype characters when necessary for boldface, underlining, and italics. It reserved whole extra lines into which to drop superscripts and subscripts. The ability of this clever software to maximize the capabilities of a dumb machine is a real bonus for people with inexpensive printers.

Not For The Faint of Heart

Heartened, we again tried to select the special Spinwriter driver routine for high speed output with all the extra Spinwriter features. Again we failed. Gerry found the problem. The *Perfect Writer* people neglected to take into account one of the most sophisticated features of the printer: a special printer status line can be hardwired to the computer to make the Spinwriter perform at maximum efficiency. *Perfect Writer* doesn't support this.

We could have fixed the problem by tearing apart the printer and flipping switches on a hidden circuit board. Then the printer would have been able to use a software status routine. We couldn't make this change because we didn't have the extra-cost Spinwriter service manual with all the necessary information. In any case, such a job is not for the faint of heart.

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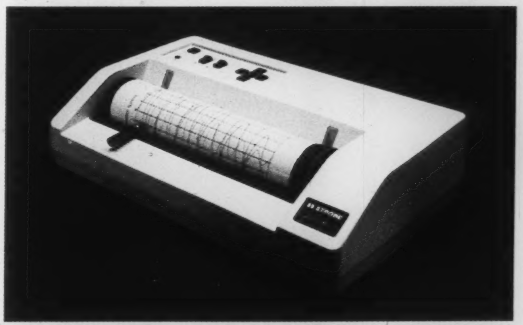

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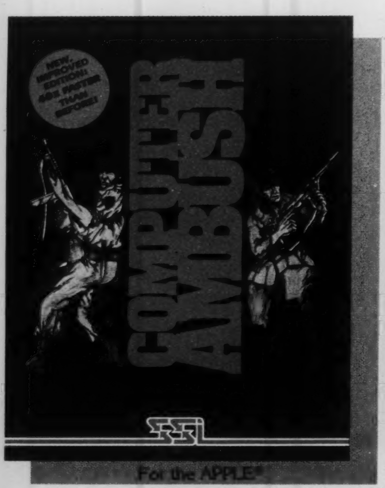
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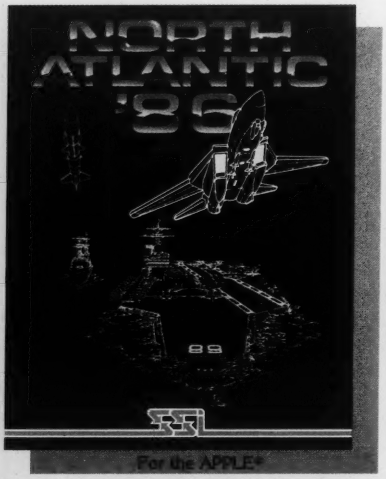
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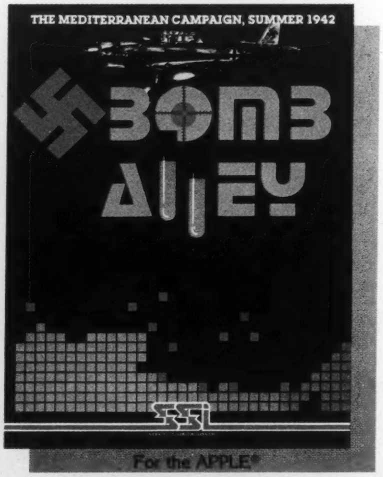
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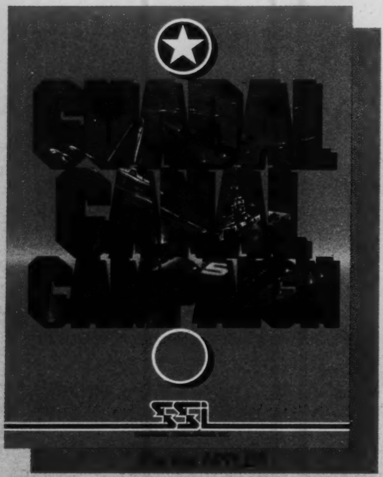
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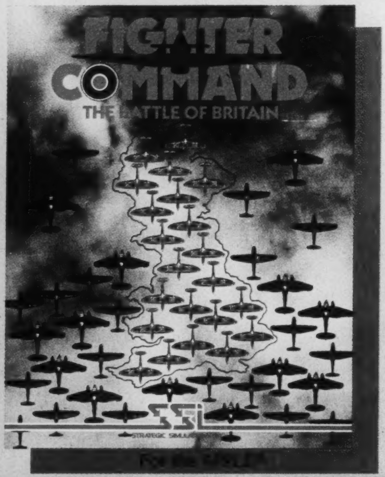
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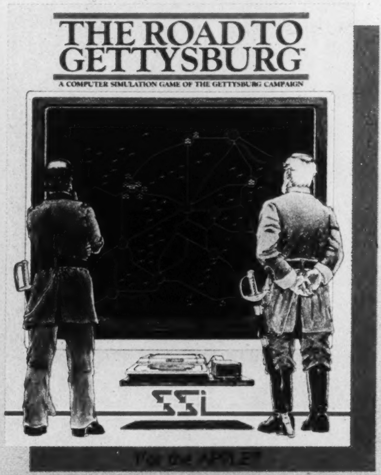
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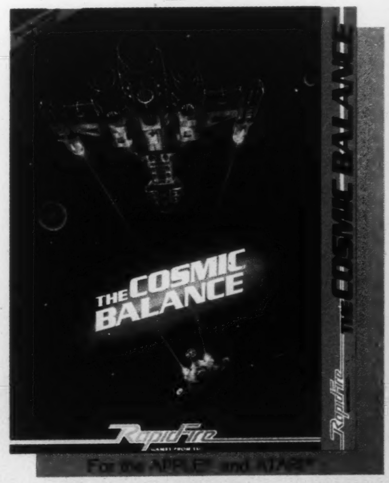
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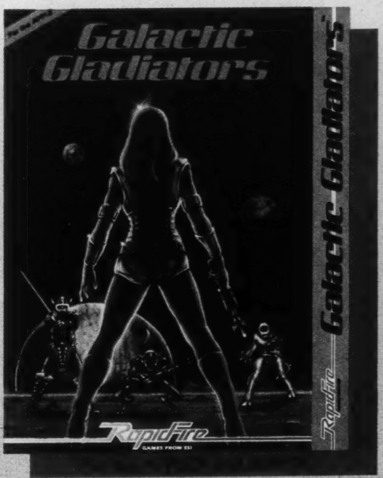
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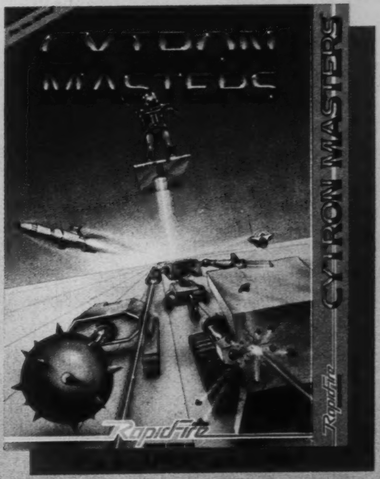
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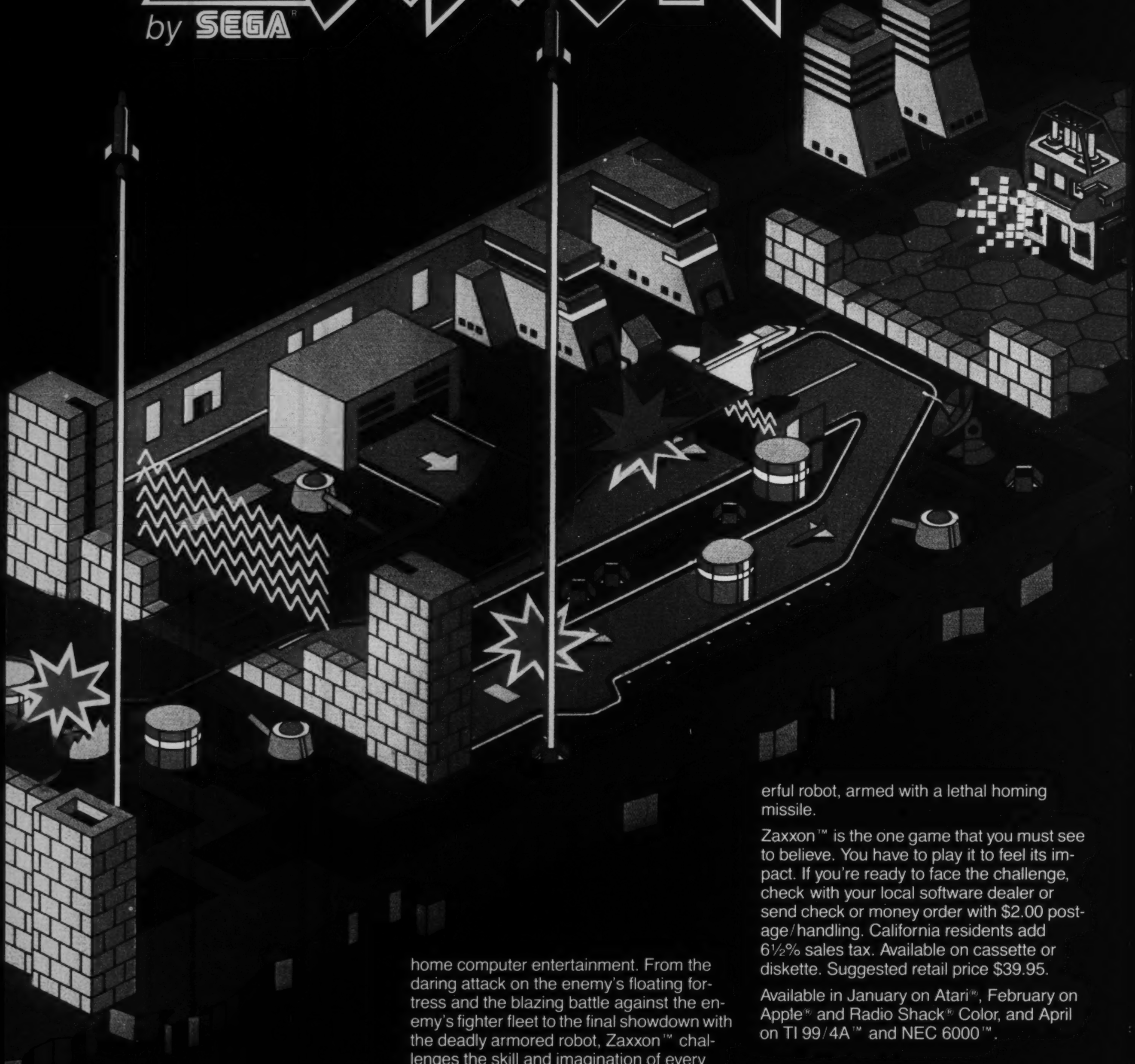

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weakest link of *Perfect Writer*. While the publishers have assembled a superb total package, they have made a critical marketing error in ignoring or understanding the complexity of the installation process.

Computer Services Corporation has targeted its ads to the new cadre of non-computer people who can effectively use *Perfect Writer*: small business owners, managers, authors, grantsmen, pool typists. The manual is written for naive users who need know nothing about CP/M or their computer. The price is attractive, but for $289 retail price, what dealer in his right mind is going to spend several hours installing a custom version of *Perfect Writer*? And what alternative does that leave the unskilled end user except to go find a capable software engineer like Gerry, or return the package for a refund?

I strongly recommend that *Perfect Writer* be installed by a dealer. Only the most dedicated computer users or those with common system configurations should attempt to patch in *Perfect Writer* without professional support.

I further believe that *Perfect Writer* is for use only by folks with the most brawny CP/M systems. At least 56K, high-density disk storage, and an 80-character video display are all musts. I got far enough into the installation process on my own machine to see how *Perfect Writer* performs on an older 16-line by 64-column screen: not well. The last few items in the main menu appear only temporarily before being erased by the initial command prompt.

A 40-character Apple screen would not support this menu at all. Anything less than a full 24-line display would suffer, too, because of the need to display two (and sometimes three) status lines on screen in addition to your main text and perhaps a second text window as well.

To be sure, the blame for our installation woes cannot fall squarely on the shoulders of the *Perfect Writer* people. They have carried the configuration programs to a level of extreme simplicity. Still, it is not enough. Certainly the software author can not be held accountable for the fact that every CP/M system is a little different. And it is certainly not his problem that my Vector with its memory-limiting ROMs doesn't have the guts for such powerful programs, though he certainly could have told me what hardware his program requires.

Complicated But Bug-Free

Despite these problems, I think the program itself is terrific. It is the best of its type, bar none. And lo and behold, the editor itself seems completely bug-free. It is not for everyone. The command structure requires some study and requires more keystrokes than other text editors. Whether or not you need such a complex system is a personal decision. It is a little too complicated for writing grocery lists.

I can wholeheartedly recommend *Perfect Writer* for people who want its power and flexibility, and who have adequate machines on which to run it. Today that means CP/M-compatible systems. But the real strength of the program lies in its transportability to larger 16-bit computers, such as the IBM PC, that can tap its full potential. A Unix-type version is inevitable, I suppose, and that should be a piece of software to be spoken of in reverential tones.

When today's hardware catches up with the kind of software foreshadowed by *Perfect Writer*, perhaps microcomputers will have truly arrived as powerful silent partners that quietly do our bidding, enhancing our efforts and amplifying our achievements. Certainly *Perfect Writer* points the way. ◻

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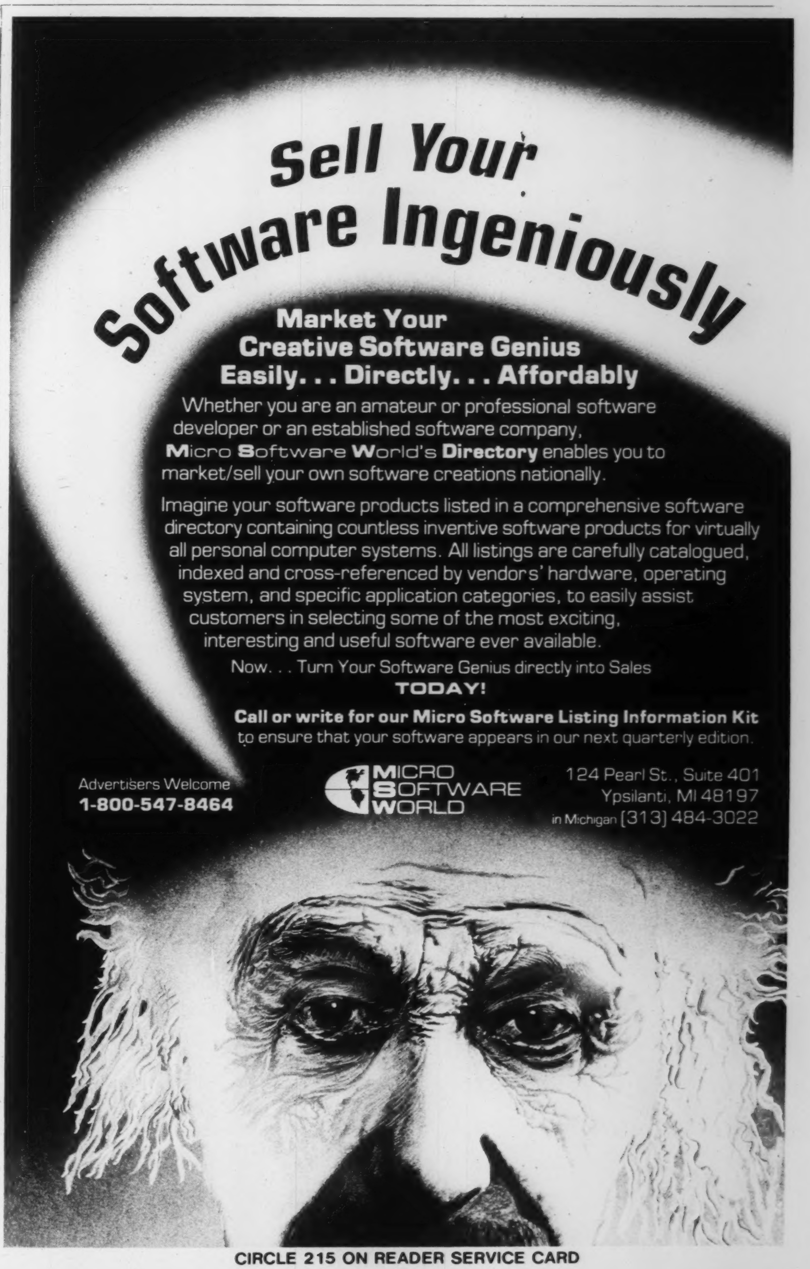

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Gutenberg

Patricia D. Glenn

creative computing

SOFTWARE PROFILE

Name: The Gutenberg Word Processor

Type: Word processor

System: 48K Apple II, Apple IIe with shift key modification, and Apple III in emulation mode

Supported Printers: Centronics 737/739, Epson MX-80FT/MX-100, NEC 8023A, Apple Dot Matrix Printer, and Qume Sprint 5 and 9

Format: Disk

Language: Machine language

Price: $315 U.S.; $375 Canadian

Summary: An excellent word processor

Manufacturer:
Micromation Limited
1 Yorkdale Rd., Suite 486
Toronto, Ontario
Canada M6A 3A1

I had seen *The Gutenberg Word Processor* demonstrated at one of the local computer stores, and decided that I had to have it. After all, who wouldn't want a program that allowed her to design her own fonts, print graphics in with the text, write in multiple columns, do headers, footers, super- and subscripts, and a host of other things? I don't know who wouldn't, but I certainly did! So, I ordered the Apple version of *Gutenberg* from Canada.

Within the week, *Gutenberg* was on my doorstep. Handsomely packaged in a slipcase and padded binder were three disks and the documentation. The documentation! It had been printed on a dot matrix printer and was beautiful. Right on the title page it said: "This manual was printed on a Centronics 739 printer. Input was generated using an Apple II personal computer. This manual was produced entirely using the *Gutenberg Word Processor.* Page make-up and positioning of text and headings was achieved with the *Gutenberg* composition print program. No "cut and paste" to position text was performed. All large headings were created with the *Gutenberg* paint program."

Learning to use Gutenberg from the documentation almost drove me wild.

I leafed through the manual. Oh, wow! Graphics! Boldface double size headings! Page numbers! Custom type fonts! Columns! Tables! I was thrilled.

Gutenberg comes with a tutorial disk, and after a closer look at the documentation I knew I would need it. Unfortunately, the documentation is *not* one of the strong points of this program. In fact, the documentation is probably the main factor that keeps *Gutenberg* from being the most useful word processor ever written.

The Documentation

Since the user's manual is the weakest link in what is probably destined to be a classic word processor, let's discuss it now and be done with it. The manual was written by the program author, John Wagner. Mr. Wagner makes certain assumptions about the qualifications of the reader and proceeds from there. These assumptions are not always valid.

While he gives detailed instructions for beginning to use the system, he does *not* tell you why you are doing things. This leaves you in the position of proceeding by rote with no understanding of the reasoning behind the process. To say that this is frustrating is an understatement. I must admit that learning to use *Gutenberg* from the documentation almost drove me wild.

The problem is not in the portion that explains editing. That is easily understood and easily implemented. In fact, editing with *Gutenberg* is a joy. The program is responsive and easy to use. I found the editing portion very easy to learn. My problems began when I went into the print portion of the program. With study and concentration and by working through the examples, *Gutenberg* can be learned, but the documentation offers very little help. After several days of practicing with the program, I suddenly understood what I was supposed to be doing. Others may not have this problem, but I do think it takes dedication to learn to use *Gutenberg.*

A redeeming feature of the documentation is that it is easy to find the information you need. The table of contents will lead you to the portion of the text that tells you what you need to know. I called Micromation in Canada to discuss the documentation, and they assured me the manual is being re-written by professional educators and will be more complete. It will also be indexed.

Patricia D. Glenn, 1599 Melrose Ave., Columbus, OH 43224.

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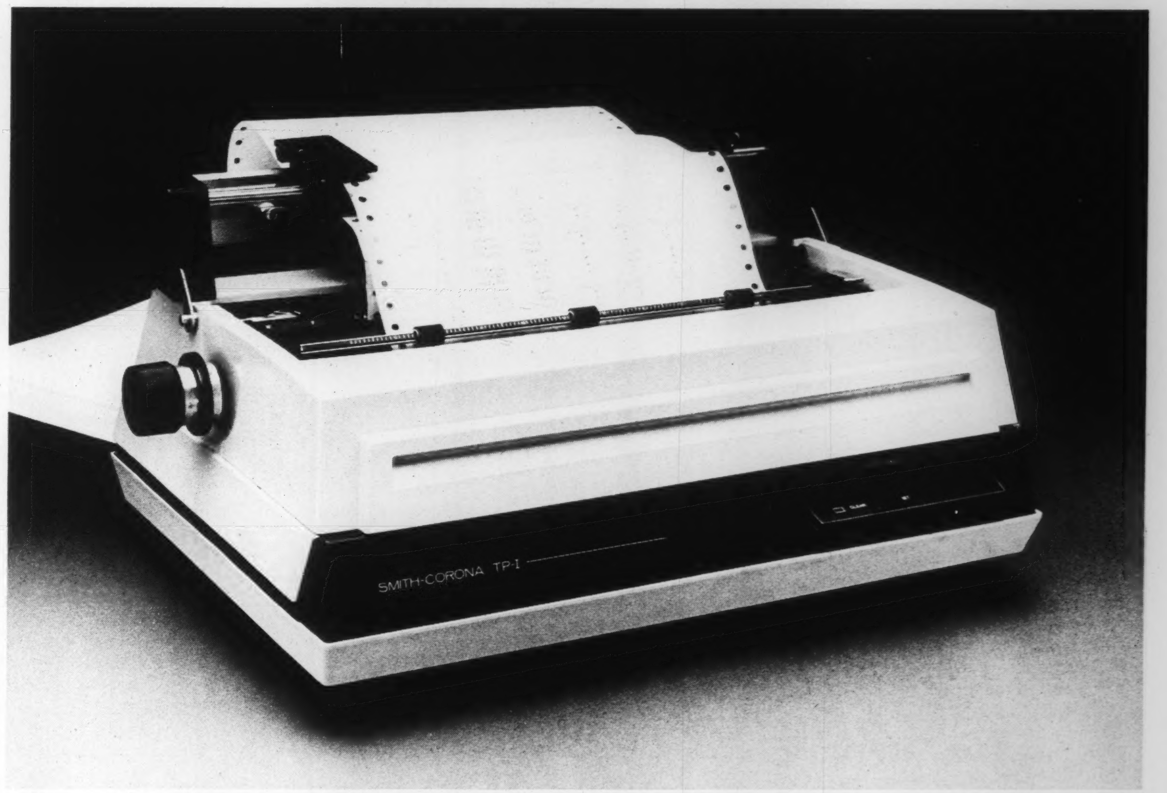

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CC-6

Gutenberg, continued...

The Tutorial Disk

Micromation seems to be aware that *Gutenberg* can be difficult to learn simply by reading about it, so they have included a tutorial on disk. This tutorial disk makes it extremely easy to learn the basic editing commands. The disk also includes a selection of ready to use formats for those who are eager to get on with using the program and reluctant to spend time learning how to use the formatting mode. These formats can be copied onto your file disk and used as is. If you examine the pre-programmed formats and their results carefully, in time you will begin to understand how formatting works. Take heart—*Gutenberg* can be learned.

Features

One of the reasons it is so difficult for the documentation to teach *Gutenberg* is that *Gutenberg* has so many features. This program does things that you probably never expected a word processor for a microcomputer to do. Features of the program include:

- Word wrap
- File insertion
- Block moves
- Copy blocks
- Global search
- Search and replace
- Centering
- Automatic pagination in either Roman or Arabic numerals
- Justification
- Proportional and micro-spacing if supported by your printer
- Underlining—both single and double if supported by your printer
- Boldface printing
- Sub- and superscript
- Multiple column formatting if supported by your printer
- Kerning
- Floating accents
- Alternate character sets
- Mixed text and graphics if supported by your printer
- File length of about 117K
- Phantom hyphen
- File merging
- Form letter capability
- Macros for often used commands, words, or phrases
- Headers
- Footers
- Paragraph, block, and hanging indents
- Just about any kind of format you can dream up. If you can express it using the Print program commands, *Gutenberg* can do it.

Gutenberg *virtually eliminates the necessity for "cut and paste" in any text processing operation.*

Inserted casually in the list above are some features you are unlikely to find in any word or text processor currently available. An example of one of the unique features of *Gutenberg* is the Paint Program. This is an Etch-a-Sketch type graphics program. It allows you to draw illustrations to accompany your text. So what? So it also allows you to save these illustrations and insert them in their proper place within the text. Of course, the Paint Program works only with dot matrix printers, but this is hardly a disadvantage. Since the illustrations are drawn dot-by-dot, you can have drawings of a truly satisfying complexity. *Gutenberg* will also accept graphics drawn under Apple DOS.

"Since we switched to computer systems, J.B., McWilliams here wants to know if we might be able to buy a printer."

Another useful feature of *Gutenberg* is its ability to redefine character sets. If, for instance, you were writing in Russian, with the Graphics Program you could redefine 115 of the ASCII values to allow you to print directly in Cyrillic. Any alternate character sets available to your dot matrix printer can be used directly, as can any foreign language daisy wheels you may need, simply be redefining the normal ASCII character set. Since *Gutenberg* is a Canadian program, the normal character set provides the accented French letters.

Since mathematics, too, is a language, it should be pointed out that the user-definable character sets also extend to mathematical symbols. Thus, a mathematician can use *Gutenberg* and a dot matrix printer to output text without the need to laboriously insert mathematical formulae by hand. Due to its unique characteristics, *Gutenberg* virtually eliminates the necessity for "cut and paste" in any text processing operation.

To call *Gutenberg* a word processor is not strictly accurate. It is, rather, a text processor. If your only need is to write a few letters, then *Gutenberg* would not be the program for you to buy. If, however, you have text that includes tables, or that could benefit from having graphics embedded in the text, or that needs a special foreign language font then *Gutenberg* is definitely your program.

User Support

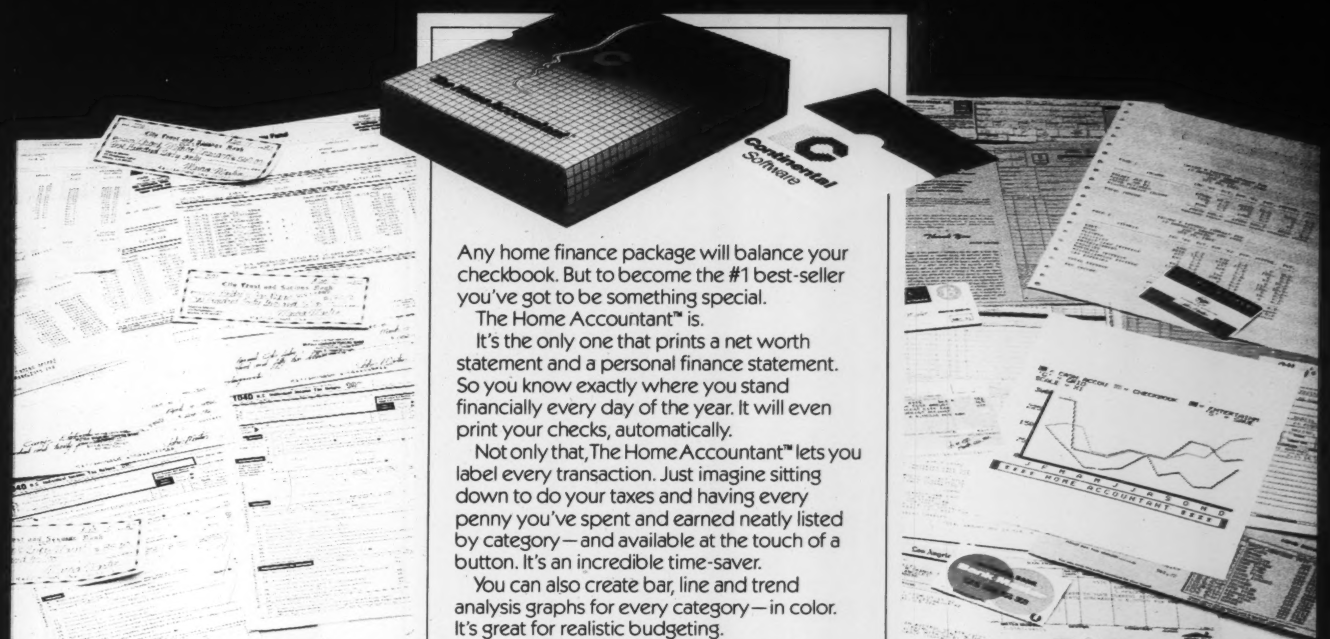
User support is readily provided by Micromation. They are knowledgeable about their product and eager to answer any questions you may have. The program is copy-protected, but a backup copy is provided, and provision is made to copy the master disk. If the master disk becomes defective within 90 days of purchase, Micromation will replace it free of charge. After the warranty period, a replacement costs less than $20. In all, I feel this is a more than reasonable answer to the problem of copy protection.

Summary

Gutenberg is a fairly expensive program that proves the adage "You get what you pay for." It has useful features that cannot be found in any other program. It is somewhat difficult to learn, but well worth the effort. *Gutenberg* defies description in a short review, so I can only suggest that you go to your dealer and ask for a demonstration. It is a program I recommend highly. □

CIRCLE 403 ON READER SERVICE CARD

The Home Accountant.™ The #1 best-seller.



Any home finance package will balance your checkbook. But to become the #1 best-seller you've got to be something special.

The Home Accountant™ is.

It's the only one that prints a net worth statement and a personal finance statement. So you know exactly where you stand financially every day of the year. It will even print your checks, automatically.

Not only that, The Home Accountant™ lets you label every transaction. Just imagine sitting down to do your taxes and having every penny you've spent and earned neatly listed by category—and available at the touch of a button. It's an incredible time-saver.

You can also create bar, line and trend analysis graphs for every category—in color. It's great for realistic budgeting.

Sound amazing? Wait, there's more.

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And it does this with every one of the two hundred* budget categories: credit cards, checking accounts, money markets, cash, rent checks, insurance payments—you customize your own financial package.

Check out The Home Accountant™ soon. You'll find it does a lot more than simply manage your money.

It manages your money simply.

*The Home Accountant™ is available for the Apple II/IBM Personal Computer/Atari 400/800 Computers/Osborne/TRS 80 Model III/Commodore VIC 64. The actual budget capacities will vary with each computer.

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Continental Software Co., 11223 South Hindry Avenue, Los Angeles, California 90045 Telephone (213) 417-3003 • (213) 417-8031

Quark introduces

A deceptively simple solution to your word processing dilemma.

If you're serious about word processing on your Apple*IIe, you may be bewildered by the sheer number of programs available. And a tad perplexed by their claims and promises. After all, a glamorous package that says "easy to use," may not even be easy to open.

The dilemma is real. And Quark is happy to provide the solution.

A proven program for serious word processing.

Quark's new Word Juggler IIe turns your computer into a dedicated word processor. You get the extraordinary ease of use, sophisticated capabilities and straightforward documentation that make our original Word Juggler a best seller on the Apple III.

For example, there's virtually nothing to memorize. Because principal editing functions are identified on a unique keyboard template — and nineteen, easy-to-install, replacement keycaps.

Changing keys is quick and simple, too. Just slide our special keycap remover over the key — twist — and pull. Your new keycaps can be in place in less than two minutes.

A flexible tool to increase your productivity.

But don't be deceived by Word Juggler IIe's disarming simplicity. The program packs the powerful features you need to quickly perform the most complex editing tasks.

Characters, words, even entire paragraphs can be deleted with a single keystroke. There are search and replace keys. Block move and copy keys. And you always have instant control over page length, margins and any other formatting parameters.

Document display and print out are easy, also. One keystroke displays your document on the screen. Another prints it. And whether

Word Juggler™ IIe.

you need to print only specific pages, multiple copies, or even documents too large to fit in memory, Word Juggler IIe can easily accommodate you.

A clever way to foil Mr. Murphy.

Even the best of us occasionally forgets when "i" does not come before "e" — and even the most agile fingers can press the wrong key. So you should also give serious consideration to Quark's new Lexicheck™ IIe — a spelling checker with a highly compressed, 50,000 word dictionary.

Accessed from within the word processor, this program lets you virtually eliminate typographical errors and common misspellings. Lexicheck IIe will scan your document at up to 8,000 wpm — then highlight, in context, the first occurrence of any word it does not recognize.

If the word is correct, as in the case of industry jargon or abbreviations, you can simply add it to your personal dictionary. If the word is actually misspelled, you can swiftly correct it.

A lot more.

These are only some of the ways Word Juggler IIe and Lexicheck IIe can help solve your word processing dilemma. Your Quark dealer has even more details, as well as complete information on our line of office automation tools for the Apple III.

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Office Automation Tools
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Suite 220
Denver, CO 80219

Word Juggler IIe	$239. sug. U.S. retail price
Lexicheck IIe	$129. sug. U.S. retail price

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GEAP Tricks

Richard C. McGarvey

creative computing
SOFTWARE PROFILE
Name: Newscript 7.0
Type: Word processor
System: 48K TRS-80 Model I, III
Format: Disk
Language: Hybrid
Summary: Among the best for the TRS-80
Price: $124.95
Manufacturer:
Prosoft Software
Box 839
North Hollywood, CA 91603
(213) 764-3131

If you have any interest in a word processor and even if you already have one, you should read this review. *Newscript 7.0* is, without a doubt, the most powerful and most convenient word processor available for the TRS-80. It has features that rival dedicated word processing systems and is underpriced at $124.95. *Newscript* gives mainframe power on your micro, and I challenge anyone to find an equal to *Newscript,* even at a higher price.

Chuck Tesler and the people at Prosoft Software were among the first to see that no really powerful word processor was available for the TRS-80. Chuck wanted something along the lines of the mainframe processor he was so familiar with. When no such program appeared on the market, Chuck called on almost 20 years of experience to produce one. The result of his work is *Newscript,* and the newest version is the culmination of a great deal of programming effort on the part of Chuck and his son, Glen.

They have responded to user input and created version 7.0 which is designed to customize itself to almost any DOS and is able to use the special features of almost every major printer on the market. Read on and you will see why I think *Newscript* is *the* TRS-80 word processing package.

> ***It is the first time, to my knowledge, that software producers have interfaced their products with others to build a solid software system.***

Speed

Some reviews have left the impression that *Newscript* is a Basic language word processor and is, therefore, slow in operation. That just isn't so. *Newscript* is primarily machine language and uses Basic only in areas where speed is not necessary.

While it is true that *Newscript* takes a few extra seconds to transfer files between edit and script modes, I feel that it is worth the wait. It is because the edit and script functions are not co-resident that *Newscript* can put so much power into available memory. Version 7.0 is unbelievably fast and has eliminated the slower routines used in earlier versions.

Owners of older versions of *Newscript* can purchase updates which include the faster routines. Speed has been increased in several areas. Now ENTER takes the cursor to the next line. SHIFT/ENTER updates the text, and it is fast. The control key has been changed so that it need not be held down. Striking the CLEAR key locks the control for one key stroke. This saves finger stretching. See the Help command printout (Figure 2) for more command changes and short cuts.

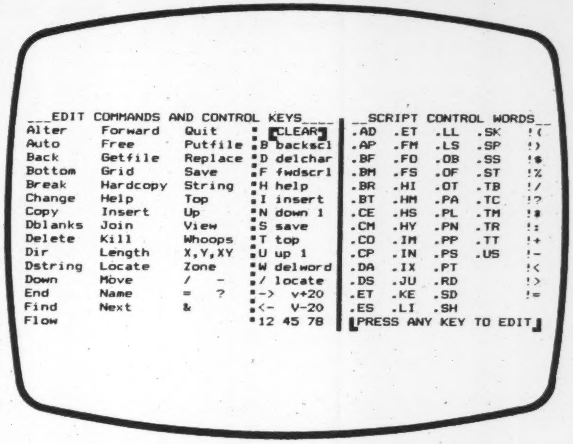
I will not dwell on this point any longer. If someone tells you that *Newscript* is slow or clumsy you can bet that he hasn't really used it. Anyone who has spent 30 minutes with *Newscript,* especially version 7.0, will tell you that it is a fine program. A few hours will have him praising *Newscript* as the best program ever.

Using The Program

Part of the ability of *Newscript* to do more than the other TRS-80 word processors is a result of its two part system. Part one is the Edit program with which text files are created. Edit also allows the use of special control codes that

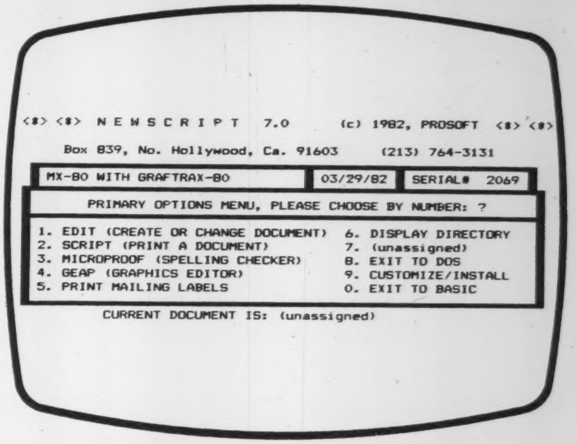
---

Richard C. McGarvey, 221 Hirschfield Dr., Williamsville, NY 14221.



```
___EDIT COMMANDS AND CONTROL KEYS____ | __SCRIPT CONTROL WORDS__
Alter    Forward  Quit     ▪ [CLEAR] | .AD  .ET  .LL  .SK   !(
Auto     Free     Putfile  ▪B backscl | .AP  .FM  .LS  .SP   !)
Back     Getfile  Replace  ▪D delchar | .BF  .FO  .OB  .SS   !$
Bottom   Grid     Save     ▪F fwdscrl | .BM  .FS  .OF  .ST   !%
Break    Hardcopy String   ▪H help    | .BR  .HI  .OT  .TB   !/
Change   Help     Top      ▪I insert  | .BT  .HM  .PA  .TC   !?
Copy     Insert   Up       ▪N down 1  | .CE  .HS  .PL  .TM   !#
Dblanks  Join     View     ▪S save    | .CM  .HY  .PN  .TR   !:
Delete   Kill     Whoops   ▪T top     | .CO  .IM  .PP  .TT   !+
Dir      Length   X,Y,XY   ▪U up 1    | .CP  .IN  .PS  .US   !-
Dstring  Locate   Zone     ▪W delword | .DA  .IX  .PT        !<
Down     Move     /   -    ▪/ locate  | .DS  .JU  .RD        !>
End      Name     =   ?    ▪->  v+20  | .ET  .KE  .SD        !=
Find     Next     &        ▪<-  V-20  | .ES  .LI  .SH
Flow                       ▪12 45 78  | [PRESS ANY KEY TO EDIT]
```

Figure 2. Newscript *command summary as displayed by HELP command from the edit mode.*



```
<#> <#>  N E W S C R I P T   7.0      (c) 1982, PROSOFT  <#> <#>

    Box 839, No. Hollywood, Ca. 91603      (213) 764-3131

 MX-80 WITH GRAFTRAX-80               03/29/82   SERIAL# 2069

      PRIMARY OPTIONS MENU, PLEASE CHOOSE BY NUMBER: ?

 1. EDIT (CREATE OR CHANGE DOCUMENT)   6. DISPLAY DIRECTORY
 2. SCRIPT (PRINT A DOCUMENT)          7. (unassigned)
 3. MICROPROOF (SPELLING CHECKER)      8. EXIT TO DOS
 4. GEAP (GRAPHICS EDITOR)             9. CUSTOMIZE/INSTALL
 5. PRINT MAILING LABELS               0. EXIT TO BASIC

         CURRENT DOCUMENT IS: (unassigned)
```

Figure 3. Newscript *Primary Options Menu.*

tell the second part, Script, which features to include in the printout. Script then takes the text and prints it out with all the special features included.

The Primary Options Menu

One of the best features of *Newscript* is the ease with which its power can be implemented. This is reflected by the Primary Options Menu (see Figure 3). As soon as *Newscript* is loaded, the main menu appears. You can then select the option needed with the press of a button.

The first thing to note is the top line of the menu. It contains the type of printer you have selected during setup, the date of the version you have and your serial number. All of this is important to have handy.

Now let's take a quick look at the menu options. First is the Edit option. Selecting number one takes you directly into Edit so that you can edit an old document or create a new one. Selection number two brings up Script so that a previously created document can be printed immediately.

Options three, four and five show how *Newscript* has been integrated with top quality software from other software producers. Option three selects *Microproof*, a spelling checker program. If you have *Microproof* or *Electric Webster* from Cornucopia Software, you will really appreciate this option. *Newscript* and *Electric Webster* are fully integrated.

Selection four deserves a special look also. GEAP is the Graphics Editor and Programmer produced by J.F. Consulting. Its purpose is to allow you to create graphics and text combinations for video display or printout to the Epson and similar printers. The program was interfaced with *Newscript* to take advantage of the ability of *Newscript* to stop printing, pull in and print an outside file, and then continue with the text. The result is that logos, charts, graphs and the like can be created by GEAP, saved in the *Newscript* format, and then mixed into the text. Figure 5 is a GEAP-created logo that can be printed by *Newscript* at any time and at any location on the page. The GEAP option also allows you to load Dotprint, the high resolution expansion module which is also part of GEAP. With Dotprint, you can edit a file in *Newscript* and then print it in special character fonts with Dotprint.

This approach to programming is unique. It is the first time, to my knowledge, that software producers have interfaced their products with others to build a solid software *system.* Prosoft, J.F. Consulting, and Cornucopia Software, should be congratulated on their successful effort. I hope other software producers get the idea and apply the same approach.

Option number five is the mailing label option. It is a separate package from Prosoft available at additional cost. It is straightforward, versatile, and easy to use.

Option number six is a handy item. When in the menu you can look at the directory of any disk. The directory is displayed with a number beside each entry. When a number is selected, that file becomes the default and the user is then returned to the menu with the selected file name in the CURRENT DOCUMENT IS: line at the bottom of the menu. After the selected file has been accepted by *Newscript* as the default file, it can be Edited or Scripted without retyping the name.

Menu selections seven, eight, and zero are straightforward. Seven is unused at this time. Eight exits to DOS READY and zero exits to Basic. Item nine is an essential part of *Newscript*. The customize/install option is the way you tell *Newscript* which DOS and printer you are using. You can also select track access rate, repeat key rate and others. Figure 4 shows the printer, DOS and printer interface select menus as they appear on the screen during customize/install.

There have been some recent changes in the customize/install option that will be of interest. First, the option has been moved out of the main program and into a separate file. This means that it no longer takes up disk space when not being used. Keep it on the original disk but remove it from the working disk. Then, if you need it later, load it from the original disk. I won't list each of the new options available during the Customize/Install routine. It is enough to say that they give almost total control to the user.

Once the user has made the proper selections, the *Newscript* disk is updated so that it contains the necessary information for proper operation on your system. On the initial power-up of the *Newscript* disk, you are prompted for system information. On subsequent power-ups, *Newscript* assumes that the same system is being used unless menu option nine is selected and new information is supplied.

Printer Support

As of this writing, *Newscript* fully supports the special features on more than 25 printers. Figure 4 shows the list of printers whose special features are supported. If your printer is not in this list, please call Prosoft because new printers are constantly being added to the list. Also, if your printer is not here, it doesn't mean that you can't use *Newscript*. I have a Radio Shack LPVI, among others, and I didn't expect

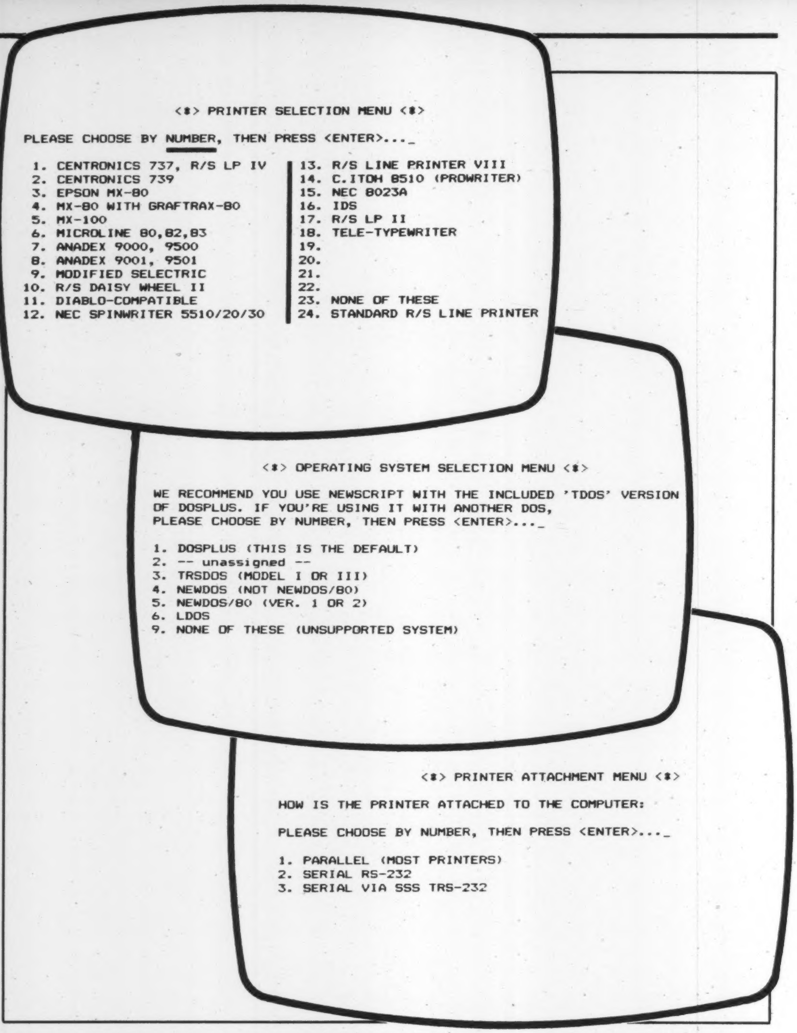
Newscript, continued...

Newscript to be able to use the fonts available to that printer, but I tried it anyway. To my surprise, *Newscript* used the expanded and compressed fonts as if it were made for the LPVI. Another feature of *Newscript*, one that permits the definition of graphic characters, allowed me to use the graphic and special symbols which are available to the LPVI but not displayable on the video. Note that all of the figures and graphics included with this review, with the exception of Figure 1, were created with GEAP, *Newscript* and the MX-80 printer.

Full, right justified proportional print is an example of *Newscript* support. Several of the popular printers have the proportional print capability but when the printer is placed into proportional mode it is impossible to get right justification. *Newscript* allows the use of proportional print, and, unlike other word processors, it places the necessary spacing *within* the words so that conspicuous between-word spaces are no longer obvious. Figure 1 is an example of the LPIV (Centronics 737) proportional print as used with *Newscript*. In the same figure, I have used varied print fonts so that you can see how fonts can be mixed in the same line without destroying the justification.

To use these features, simply precede the object text with the special start control codes and *Newscript* does the rest. Placing stop control codes at the end of the object text returns the printout to the previous mode. The special feature codes can be used in combination so that you can select, for example, italics that are boldface, expanded, and underlined. There are limitations, but they exist in your printer, not in *Newscript.*

Other special features include underlining, double width, italics, superscript, subscript, boldface, backspace (overstrike), multiple fonts (10, 12 and 16 characters per inch and proportional print). If you place a control code in your text that your printer does not support (i.e., superscript on the Epson MX-80), *Newscript* simply ignores the code, so it does not affect your text.



```
                  <*> PRINTER SELECTION MENU <*>

PLEASE CHOOSE BY NUMBER, THEN PRESS <ENTER>..._

 1. CENTRONICS 737, R/S LP IV  | 13. R/S LINE PRINTER VIII
 2. CENTRONICS 739             | 14. C.ITOH 8510 (PROWRITER)
 3. EPSON MX-80                | 15. NEC 8023A
 4. MX-80 WITH GRAFTRAX-80     | 16. IDS
 5. MX-100                     | 17. R/S LP II
 6. MICROLINE 80,82,83         | 18. TELE-TYPEWRITER
 7. ANADEX 9000, 9500          | 19.
 8. ANADEX 9001, 9501          | 20.
 9. MODIFIED SELECTRIC         | 21.
10. R/S DAISY WHEEL II         | 22.
11. DIABLO-COMPATIBLE          | 23. NONE OF THESE
12. NEC SPINWRITER 5510/20/30  | 24. STANDARD R/S LINE PRINTER
```

```
                  <*> OPERATING SYSTEM SELECTION MENU <*>

WE RECOMMEND YOU USE NEWSCRIPT WITH THE INCLUDED 'TDOS' VERSION
OF DOSPLUS. IF YOU'RE USING IT WITH ANOTHER DOS,
PLEASE CHOOSE BY NUMBER, THEN PRESS <ENTER>..._

1. DOSPLUS (THIS IS THE DEFAULT)
2. -- unassigned --
3. TRSDOS (MODEL I OR III)
4. NEWDOS (NOT NEWDOS/80)
5. NEWDOS/80 (VER. 1 OR 2)
6. LDOS
9. NONE OF THESE (UNSUPPORTED SYSTEM)
```

```
                  <*> PRINTER ATTACHMENT MENU <*>

HOW IS THE PRINTER ATTACHED TO THE COMPUTER:

PLEASE CHOOSE BY NUMBER, THEN PRESS <ENTER>..._

1. PARALLEL (MOST PRINTERS)
2. SERIAL RS-232
3. SERIAL VIA SSS TRS-232
```

Figure 4. Printer make, type and DOS selection menus as displayed on CRT during initial setup or Customize/Install option.

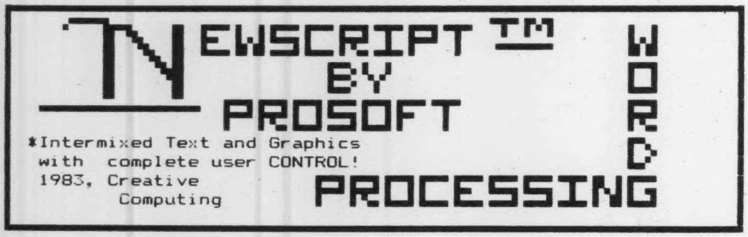
Graphics and Special Characters

Now a quick look at the graphics of *Newscript*. The control key plus 7, 8, 4, 5, 1, or 2 causes a graphic element to be lit. If you look at your keypad you will notice that these numbers are arranged in the same position as the graphic elements. When you use this graphic keypad, the cursor does not advance. In this way you can set the elements you want and then move on. The keys work in a toggle fashion, with the first strike turning on the element and the next turning it off. You can also print characters that are not on the keyboard. The bell on the Epson (CHR$(7)) is an example.

I know that graphics are not everyone's cup of tea. You may not even care if you can use the special features of your printer. But isn't it good to know that there is a software package that is so well thought out and so well written, that it allows you to use all of the features if you want?

Special Features

A detailed account of the special features available in *Newscript* would be much too long for this publication. In



NEWSCRIPT TM
BY
PROSOFT
WORD
PROCESSING
*Intermixed Text and Graphics
with complete user CONTROL!
1983, Creative
Computing

Figure 5. This logo, created with GEAP, can be printed by Newscript *at any time and in any location within a text file.*

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KUBO

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Transpak 2	Transend 2 Electonic File Transfer	300-baud Modem Card
Transpak 3	Transend 3 Unattended Electronic Mail	300-baud Modem Card
Transpak 2 +	Transend 2	TransModem 1200 with serial interface and cable
Transpak 3 +	Transend 3	TransModem 1200 with serial interface and cable

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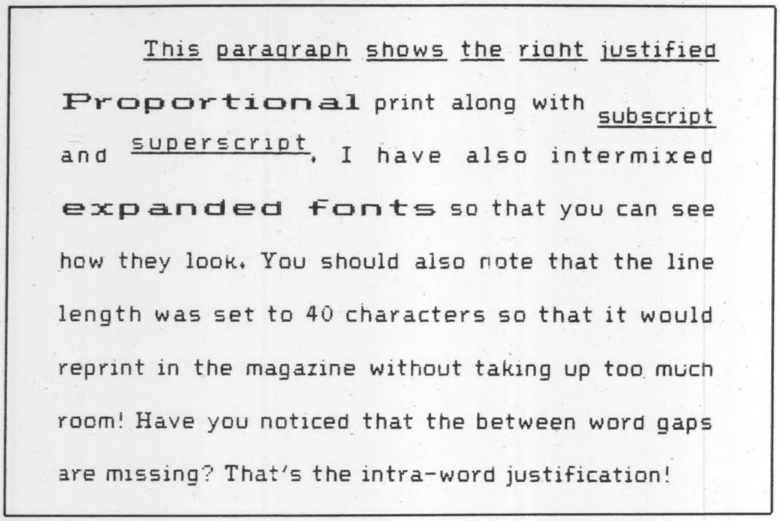
this section, I will briefly mention some of the special features available.

The first thing to consider is text manipulation. *Newscript* allows several versions of delete and insert. They include the deletion and insertion of blocks, lines (any number), words, and characters. Text can also be located, changed, or altered. Block moves are also possible and are much easier than with *Scripsit*. In addition, it is possible to copy a block so that it can be repeated elsewhere in text without retyping. Screen dumps of text are also accomplished easily.

Next I will briefly say that justification is fully supported. You can justify right or left or turn off the justification. You can also control concatenation.

Now consider command control. Most commands are entered on the command (top) line of the display. Only enough of the command to make it unique is needed. Many of these same commands can be entered directly from the text areas using the control key and the appropriate command key. Many of the control commands, such as insert character, are toggled. They use the same key to turn them on and off, and they stay in effect until cancelled.



This paragraph shows the right justified Proportional print along with subscript and superscript. I have also intermixed expanded fonts so that you can see how they look. You should also note that the line length was set to 40 characters so that it would reprint in the magazine without taking up too much room! Have you noticed that the between word gaps are missing? That's the intra-word justification!

Figure 1.

Multiple Commands

Multiple command selection is next. Many of the commands that can be applied to text in the edit mode are also options in the script printout mode. For example, consider .DS, which stands for double space. If the whole document is to be double spaced, you can select the DS print option when in Script. If only portions of the document are to be double spaced, the .DS can be placed on a line during the edit phase and the printout will default to single space until the DS is hit. Then double space will start and continue until cancelled.

Titles, headers and footers are common needs. Top titles, bottom titles, headers, footers, and page numbering can all be easily controlled to allow printing on odd numbered, even numbered, or every page.

Line spacing and page formatting include the following features among others. In Script, double and triple space options are presented at print time. In Edit, you can set double space, single space, space half lines, skip n lines if not at top of page, space n lines, force page, conditional force page, start new print line, and start new paragraph (spacing selectable).

File handling is one of the most powerful features in *Newscript*. With .AP filespec as the last line in one file, the stated filespec is pulled in, on completion of the original file, and the new file is printed to the pre-set options. These files can be appended endlessly and the .ST code will stop the printing and await the change of a disk. You can also imbed a filespec (.IM) which causes *Newscript* to stop, pull in the specified file, print it, and then return to where it left off in the original file. You can use this feature to call often used text, such as your own address.

Additional features include .RD which

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If you're considering a personal computer, there's a new question you need to ask yourself. Why buy a computer that isn't portable?

For more information on the COMPAQ Portable Computer and the location of the Authorized Dealer nearest you, write us. COMPAQ Computer Corporation, 20333 FM149, Houston, Texas 77070. Or call 1-800-231-9966.

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COMPAQ™
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CIRCLE 139 ON READER SERVICE CARD

There is a word that describes your choices in flexible disks today. That word is "ordinary." The woods seem to be full of offerings of middling quality, neither good nor bad, not necessarily cheap but not overly expensive for the most part, products that are just so-so, just average, just... well, just ordinary.

But now there's a new word in flexible disks. Ultra Magnetics. A word that redefines the state-of-the-art in flexible disk price performance rather than reinforcing the current state-of-the-marketplace. By itself, *Ultra* means "extra ordinary." And by itself is where you'll place the Ultra Magnetics product when you have a chance to compare it to others.

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A NEW COMPANY WAS NEEDED AND STARTED

Fortunately, other people in the diskette industry recognized that making ultra-high quality diskettes required the *best* and newest manufacturing equipment as well as the best people to operate this equipment. Since most manufacturers seemed satisfied to give you only the everyday quality now available, an assemblage of quality conscious individuals decided to start a new company to give you a new and better diskette. They called this product the *Ultra* diskette, and you're going to love them. Now you have a product you can swear by, not swear at.

HOW THEY MADE THE BEST DISKETTES EVEN BETTER

The management of *Ultra* Magnetics then hired all the top brains in the diskette industry to make the *Ultra* product. Then these top bananas (sometimes called floppy freaks) created a new standard of diskette quality and reliability. To learn the "manufacturing secrets" of the top diskette makers, they've also hired the remaining "magnetic media moguls" from competitors such as Verbatim, Memorex, Dysan and many more. Then all these top-dollar engineers, physicists, research scientists and production experts (if they've missed you, send in your resume to *Ultra*) were given one directive...to pool all their manufacturing know-how and create a new, better diskette.

HOW ULTRA DISKETTES ARE MANUFACTURED

The *Ultra* Magnetics crew then assembled the newest, totally quality monitored, automated production line in the industry. We know that some of Ultra's competitors are still making magnetic media on equipment that is old enough to vote. Since all manufacturing equipment at *Ultra* is new, it's easy for *Ultra* to consistently make better diskettes. You can always be assured of ultra-tight tolerances and superb dependability when you use *Ultra*. If all this manufacturing mumbo-jumbo doesn't impress you, we're sure that at least one of these other benefits from using *Ultra* diskettes will:

1. **TOTAL SURFACE TESTING** - For maximum reliability, and to lessen the likelihood of disk errors, all diskettes must be totally surface tested. At *Ultra*, each diskette is 100% surface tested. *Ultra* is so picky in their testing, they even test the tracks that are in between the regular tracks.
2. **COMPLETE LINE OF PRODUCTS** - For a diskette to be useful to you and your computer, it must be compatable physically. *Ultra* Magnetics has an entire line of 5¼-inch and 8-inch diskettes.
3. **SPECIALLY LUBRICATED DISK** - *Ultra* uses a special oxide lubricant which is added to the base media in the production of their diskettes. This gives you a better disk drive head to media contact and longer head and disk life.
4. **HIGH TEMPERATURE/LOW-MARRING JACKET** - A unique high temperature and low-marring vinyl jacket allows use of their product where other diskettes won't work. This special jacket is more rigid than other diskettes and helps eliminate dust on the jacket.
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7. **CUSTOMER ORIENTED PACKAGING** - All *Ultra* disks are packaged 10 disks to a carton and 10 cartons to a case. The economy bulk pack is packaged 100 disks to a case without envelopes or labels.
8. **LIFETIME WARRANTY** - If all else fails, remember, all disks made by *Ultra* Magnetics, (except bulk pack) have a lifetime warranty. If your *Ultra* disks fail to meet factory specifications, *Ultra* Magnetics will replace them under the terms of their warranty.
9. **SUPERB VALUE** - With Ultra's automated production line, high-quality, error-free disks are yours without high cost.

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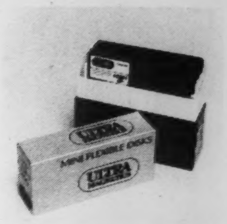

SAVE ON ULTRA DISKETTES Product Description	Part #	CE quant. 100 price per disc ($)
8″ SSSD IBM Compatible (128 B/S, 26 Sectors)	**81726**	1.99
8″ SSDD IBM Compatible (128 B/S, 26 Sectors)	**81701**	2.49
8″ DSDD Soft Sector (Unformatted)	**82701**	3.19
8″ DSDD Soft Sector (1024 B/S, 8 Sectors)	**82708**	3.19
5¼″ SSSD Soft Sector w/Hub Ring	**50001**	1.79
5¼″ Same as above, but bulk pack w/o envelope	**00153**	1.39
5¼″ SSSD 10 Hard Sector w/Hub Ring	**50010**	1.79
5¼″ SSSD 16 Hard Sector w/Hub Ring	**50016**	1.79
5¼″ SSDD Soft Sector w/Hub Ring	**51401**	1.89
5¼″ Same as above, but bulk pack w/o envelope	**00096**	1.49
5¼″ SSDD 10 Hard Sector w/Hub Ring	**51410**	1.89
5¼″ SSDD 16 Hard Sector w/Hub Ring	**51416**	1.89
5¼″ DSDD Soft Sector w/Hub Ring	**52401**	2.79
5¼″ Same as above, but bulk pack w/o envelope	**00140**	2.39
5¼″ DSDD 10 Hard Sector w/Hub Ring	**52410**	2.79
5¼″ DSDD 16 Hard Sector w/Hub Ring	**52416**	2.79
5¼″ SSQD Soft Sector w/Hub Ring (96 TPI)	**51801**	2.49
5¼″ DSQD Soft Sector w/Hub Ring (96 TPI)	**52801**	3.49

SSSD = Single Sided Single Density; SSDD = Single Sided Double Density; DSDD = Double Sided Double Density; SSQD = Single Sided Quad Density; DSQD = Double Sided Quad Density; TPI = Tracks per inch.
For less than 100 diskettes, add 10% to our quantity 100 price.
For additional compatibility info call Ultra Magnetics at 408-728-7777.

The Small Print

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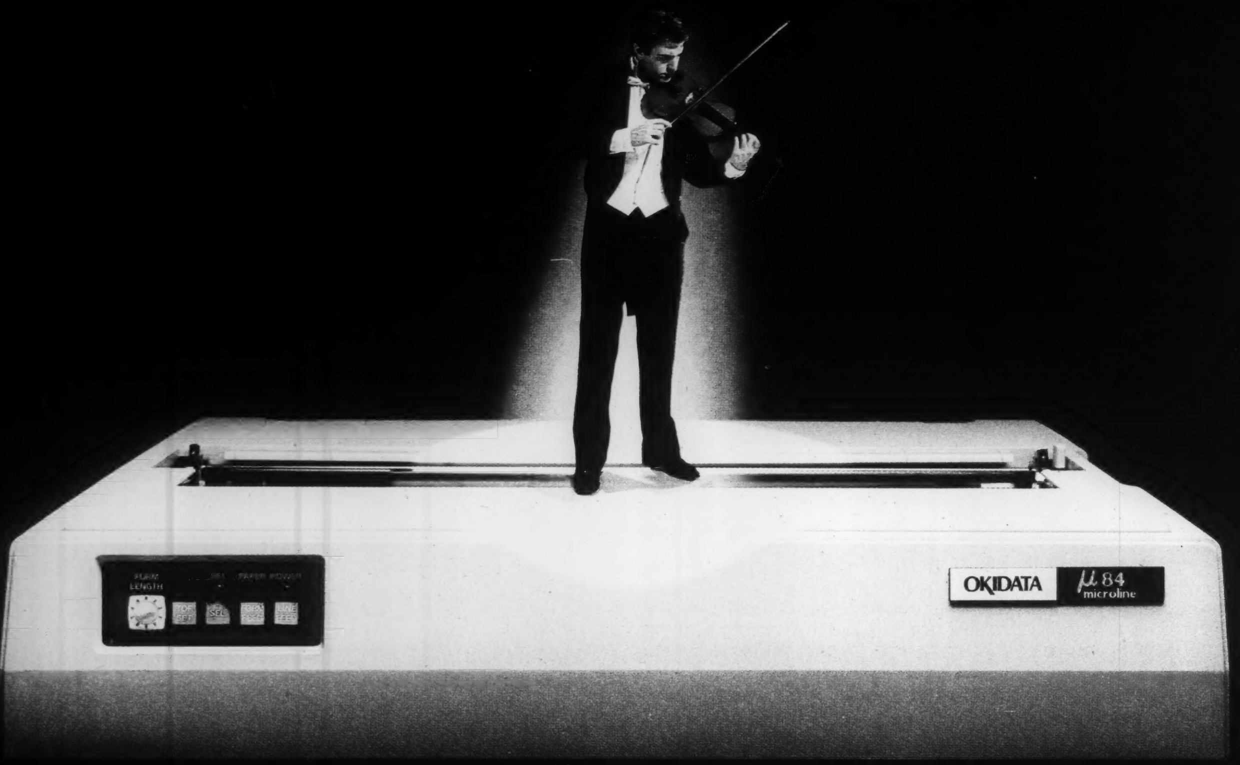

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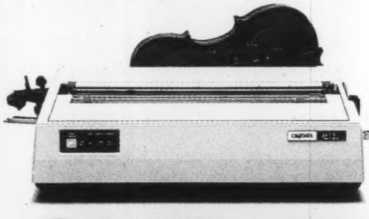

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Newscript, continued...

reads in a form letter address, .TC,which indicates text to be saved for the table of contents and .IX which labels key words for the index.

The .KE code is especially useful. When Script hits this code (which can be inserted anywhere) it stops and awaits text input directly from the keyboard. Up to a full line can be entered and that line, escape codes and all, is then processed as any other text. This allows the update of items that change from printing such as names, prices, dates and the like.

Form letters seem to be of interest to many people, so I'll spend a paragraph explaining a bit about them. There are several *Newscript* commands that aid in the creation of form letters. The first is .RD which stands for read. If you create a mailing list using the editor, you can then use .RD to get those addresses one at a time. The file can also contain salutations so that you can personalize the letter. When the .RD command is hit, the next address in the file is pulled in and printed, thus putting a new address on each letter.

Special Characters and Codes

It is possible to create not only graphic characters, but also special characters and codes to be printed. You can enter the hexadecimal value for the graphic or special character and that code will be sent to the printer. With this option you can print symbols on the printer that you can't print on the screen.

To see how the document will look, you must print it.

Miscellaneous commands include comment lines, which are similar to REM lines in Basic and allow you to make notes to yourself in your text. They are ignored by all processing. Darkness or boldface can be set to the degree of darkness desired if the printer is capable of using the feature. Escape characters can be redefined to allow the use of an escape sequence as normal text. The .US command underscores the specified text, and finally, the .TR command allows the translation of a specified range of values to a third range. This is handy for adding 32 graphic characters so that the MX-80 will print them. It is also possible to use ASCII characters to draw a graphic display and then translate them into regular graphic characters.

Indent can be set to a specific value, or it can be incremented or decremented by a specified value. The amount of the indent is up to you. Hanging indents or bullets can be done automatically with .HI or manually with .OF. The code .CE ON starts the centering of text and .CE OFF turns it off. The .TB @a,b,c... allows the setting of tabs.

Finally, for this section, a brief look at the script operation commands. It is possible, before printout begins, to select one or more of the following features: double or triple space, video output only, stop at the end of the page, print only pages within the specified number range, produce multiple copies, print each filespec in the margin, print all text in boldface, print number lines in the left margin, and print only table of contents.

***File handling is one of the most powerful features in* Newscript.**

Maybe you are not interested in using all of these fancy formatting commands; *Newscript* is still for you. It has a full set of defaults so that you can just sit down and type.

While I have briefly covered most of the special commands either specifically or by category, it is important to remember that I could not possibly mention them all in a review. If you have a special requirement that you do not see here, or if you would like clarification on a special feature I have mentioned, call or write Chuck Tesler at Prosoft. He will be glad to answer any questions.

Documentation

The impressive and slightly intimidating documentation of *Newscript* serves two purposes. The first and most obvious is to instruct the user in *Newscript* operation and to serve as a reference guide during processing sessions.

The second and less obvious purpose is to serve as an example of the capabilities of the program. The entire manual (with the exception of an occasional drawing) was written using *Newscript* and printed on the Radio Shack Line Printer IV.

The manual is 178 pages long including the index (also compiled and printed by *Newscript*). It is well laid out, and if you start at the beginning, you can be using *Newscript* in 30 minutes.

Conclusion

There are a few features that *Newscript* doesn't have that some people might want. For example, it does not have on-screen formatting. To see how the document will look, you must print it. This will not be changed, because it is impossible to show super/subscripts, expanded characters, proportional print, etc., on the monitor.

Newscript will not do automatic footnotes either, and at this time there are no plans to add that feature. Finally, *Newscript* does not support multiple columns as *SuperScriptsit* does. That feature will be added soon.

There is an additional hangup that may pose a minor problem for some users. Some Z80 processors are a bit too slow to support *Newscript*, and if you have an older Model I, you might have to install a Z80A. If this is the case, you are probably having trouble with other software as well. The fault is not with *Newscript* but with your hardware.

All things considered, I recommend *Newscript* highly. I have used most of the currently available word processors and I have never seen one with the power of *Newscript*. If you're looking for a word processor, consider *Newscript*. If you have an older version of *Newscript*, upgrade. ☐

CIRCLE 404 ON READER SERVICE CARD

"You've been replaced by a computer, Reardon... A female computer."

Daisy

Grace M. Bowers

creative computing

SOFTWARE PROFILE

Name: Daisy
Type: Word processing
System: TRS-80 Model I or III
Format: Disk
Language: Machine language
Summary: Advanced, detailed word processing package
Price: $74.95
Manufacturer:
Med Systems Software
P.O. Box 3558
Chapel Hill, NC 27514

As the owner of a small but growing word processing business built around a TRS-80 Model III and Daisy Wheel II printer, I quickly developed a love-hate relationship with Radio Shack's *Scripsit.* I will never understand why so many practical and necessary functions were left out of such a basically good word processing program. *Scripsit* will *not* do the following: underlining, boldface print, superscripts, subscripts, right-justified proportional spacing, and special characters other than those on the keyboard. Nor does it offer any provision for looking at disk directories or killing files from within the program, checking where pages will end prior to printout, pausing printout to change printwheels or insert text, placing footnotes, or reserving print formats.

Daisy *picks up where* Scripsit *leaves off.*

In attempting to find a satisfactory patch to fill in where *Scripsit* leaves off, I have been further frustrated. Nothing was happening to relieve my growing depression, until I discovered *Daisy* by Med Systems Software. This package works with the Radio Shack Daisy Wheel II printer to do most of the above, and much more.

When I saw the ad for the *Daisy* word processing package, my first thought was that this product seemed like more than just another patch to *Scripsit.* The list of capabilities for "professional/scientific" word processing was impressive, and the ad read "It is the best. Period. We guarantee you will agree." There was even a 14-day money-back guarantee. I couldn't resist.

Daisy for the TRS-80 Model I or III uses Model I *Scripsit,* because of the difficulties encountered when Radio Shack decided to market Model III *Scripsit* with only two backup copies. The program is compatible with TRSDOS 1.1 or 1.3 (not 1.2) and NEWDOS 80, although the documentation states that other disk operating systems should be compatible if suitable zaps are applied.

Documentation

The documentation was the first thing about this package that warmed my soul; it consists of about 120 loose leaf pages in an attractive binder, and is very well written. The manual is divided into logical sections, with a table of contents in front and a complete index in back. There is also a handy laminated reference card which lists useful information about control codes. I should point out, however, that *Daisy* is not the place to begin if you have never used *Scripsit. Daisy* picks up where *Scripsit* leaves off, and the documentation assumes that you already have a thorough knowledge of *Scripsit.*

I found the program very easy to get up and running. If you are using TRSDOS 1.3, an XFERSYS is necessary. With the Med Systems advertisement torn from the magazine and sitting before me, I deliberately went through the list of *Daisy* functions and tested ev-

---

Grace M. Bowers, 1582 Glenbrook Dr., Santa Rosa, CA 95401.

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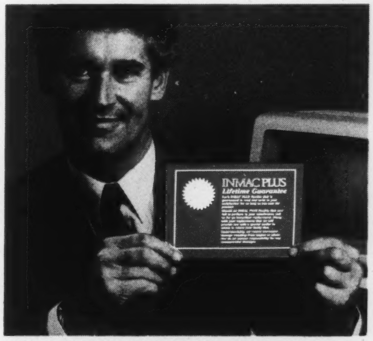

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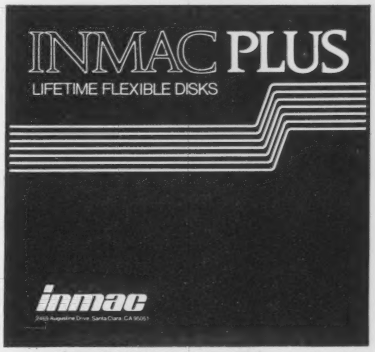

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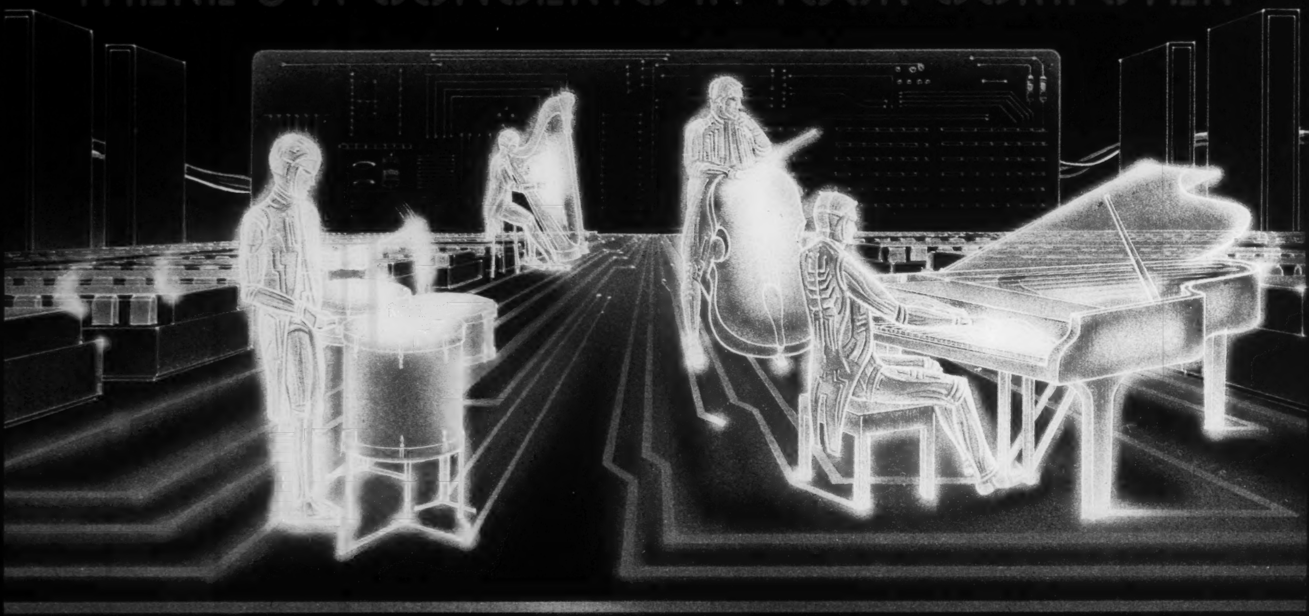
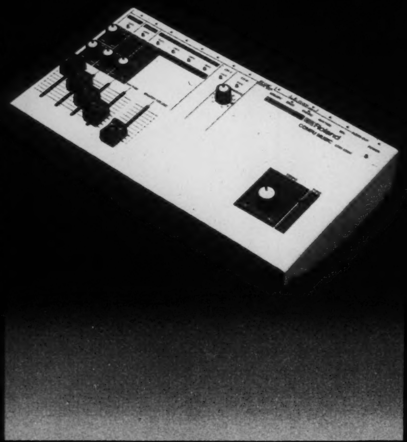


COMPU-MUSIC



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The Roland CMU-800 Synthesizer retails for $495.00. The Compu-Music Software retails for $70.00 and is available for the Apple II and NEC computers. For more information, see your computer dealer or contact:
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Roland

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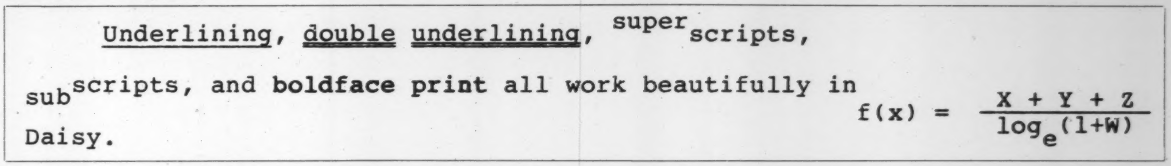

Underlining, double underlining, $^{\text{super}}$scripts, $_{\text{sub}}$scripts, and **boldface print** all work beautifully in Daisy.

$$f(x) = \frac{X + Y + Z}{\log_e(1+W)}$$

Examples of the special functions available.

ery one. I was not disappointed, except in a few respects, which I will discuss later.

Daisy is a carefully written program that enhances *Scripsit* in many practical ways. As the manual states, "...*Daisy* is mainly aimed at the production of technical reports," and this it does superbly. It comes complete with suitable formats built in for the three print pitches, which are referred to as Mono (10 pitch), Tiny (12 pitch), and Prop (proportional); or the user can enter his choice of format with regular *Scripsit* commands. When copy markers are used, your chosen format remains as the default, so laborious entering of format lines is no longer necessary.

There is also a nifty function which allows you to begin printing in the middle of a text that has headers and footers. By invoking this simple command, the program will use the correct page format and the proper header or footer, and will even remember to print the right page number. Anyone who has struggled with the tedious business of using copy markers in *Scripsit* will consider this a gift from heaven.

Features

Daisy retains all of the text editing features of *Scripsit;* none of the original commands are changed. You can actually load *Daisy* and use only *Scripsit* commands without any problem. But while *Scripsit* alone will not, for example, allow you to pause printing in the middle of a page, *Daisy* does; and you can change print wheels, or even insert text to create personalized form letters. *Daisy* can also cease printing in the middle of a page—useful if you want to print only a portion of something or when experimenting.

Underlining, double underlining, superscripts, subscripts, and boldface all work beautifully in *Daisy.* Another useful feature allows for positioning of the printhead anywhere on a line—a vital capability if you want to arrange proportional print in neat columns.

Daisy offers an impressive array of over 100 special symbols, both "intrinsic" (actually located on the daisy wheel), and "extrinsic" (contrived), for mathematical, scientific, and foreign language applications. The extrinsic characters are very good representations, but are available only in Mono (10 pitch) print. *Daisy* has six basic control characters; two of them are devoted primarily to producing special symbols when combined with keyboard characters. In addition, the symbols can be positioned very precisely within the text so that such things as mathematical equations, scientific formulae, and foreign language text really look professional.

The control characters combine with one another and with keyboard characters, and although these many combinations seem confusing at first, you quickly begin to remember what the control characters look like on the screen. Control characters are produced by pressing the SHIFT key and another key (such as ENTER) simultaneously, in much the same way the control keys for *Scripsit* operate. The author was striving for simplicity amidst complexity, and I think he succeeded.

Underlining, double underlining, superscripts, subscripts, and boldface all work beautifully.

The documentation includes this example:

$$f(x) = \frac{X + Y + Z}{\log_e (1+W)}$$

which gives you an idea of the kind of technical text that *Daisy* does especially well. Remember, *Scripsit* alone is entirely incapable of producing such an equation.

Another very fine feature of *Daisy* is that it changes the order in which *Scripsit* goes about checking a document in preparation for printout. Ordinarily, when you ask for a printout in *Scripsit* the first thing the program does is check to see if the printer is turned on; it will not go on to format the text unless the printer is running. *Daisy* makes no such demand. It will allow you to format your text completely without a printer even being connected. After formatting, *Scripsit* offers no method for finding out where pages will end, which often leads to monumental frustrations and piles of wasted printout. *Daisy,* on the other hand, includes a page-end function; you can check to see that each page terminates at an appropriate point *before* beginning to print.

It is important to note that most of the control characters used in *Daisy* are completely ignored while *Scripsit* formats text and decides where to insert carriage returns. Therefore, you can have a large number of "invisible" control characters in a line without running into trouble. Experience with other *Scripsit* patches has familiarized me with the problems that can develop when the program *does* count these "invisibles." In such a situation, you can have a line of text with 16 invisible control characters that appears to stretch clear across the video screen; but when it is printed, that line is 16 spaces short because *Scripsit* has counted all the invisible codes in deciding where to return the carriage. With *Daisy,* the line with 16 control codes will still appear on the video screen, but the carriage return will probably occur in the middle of the following line because *Daisy* skips over the invisible codes as it counts spaces. Obviously, this presents problems if you wish to hyphenate the text; you must be careful when attempting to hyphenate if there are more than just a few invisible codes present.

Daisy also allows you to manipulate spaces in *Scripsit* for a variety of effects. You can insert a "hard" space between two words, for example, to prevent them from being separated or to preserve the integrity of certain expressions when right justification is used. By inserting hard spaces, *Daisy* makes it possible to underline blanks, both between words and to create long underscores.

Footnotes

The placing of footnotes on a page, a troublesome task under the best of circumstances, is made much easier in *Daisy. Daisy* allows for the creation of one "footnote block" per page, which can contain up to ten lines of 10 pitch print, or correspondingly fewer lines of either 12 pitch or proportional. The limited space available in the footnote block may cause problems if you have to prepare pages of text that are rampant with footnotes, but should be adequate for most users.

Daisy, continued...

The Folio feature allows you to print text in two or three columns per page—ideal for newsletters. Folio is easy to set up, and the results are pleasing. Standard headers, footers and footnotes may be used, and you can choose from either Tiny or Prop pitches. Tiny can be right-justified in Folio; Prop cannot.

Disappointment

At this point I will voice my major disappointment with *Daisy;* it involves the use of proportional print. Upon reading the documentation, I found that "no claim is made to give right justification in the proportional pitch . . .if you were expecting right-justified texts in proportional pitch then ask for your money back, you have made a dreadful mistake." (*Daisy* Manual, p. 5.)

The author does state that the program is designed for the production of technical reports, and the Folio feature has little to do with technical text, but it was in experimenting with Folio that I felt very acutely the lack of true proportional spacing with right justification in the *Daisy* package. For example, the Folio format for proportional print produces two nicely arranged columns of text. But the right margins appear very uneven. In addition, no mention is made in the documentation of any provision for hyphenating words in Folio mode. There is a demand for documents with true proportional spacing and right justification, and it is frustrating to have hardware capable of supplying that demand but software that is incapable of doing so. Thus, my feeling is that if *Daisy* were expanded to include this one feature, it would be a truly superlative product.

> ***The Folio feature allows you to print text in two or three columns per page—ideal for newsletters.***

Another problem which I still cannot explain involves obtaining a disk directory from within *Daisy.* Using TRSDOS 1.1, I couldn't get a directory at all. With TRSDOS 1.3, the directory appeared along with an irritating little graphics block that wouldn't go away. A telephone call to the company revealed that they had never heard of such a problem, and they suggested that I send them my disk.

Summary

Overall, I was very impressed with the careful attention to detail that is obvious in *Daisy.* The author knew what he wanted to accomplish, and did it in a thorough way. In my experience, software and documentation are too often written without an intimate knowledge of what needs to be included to make a program really professional and useable. Details are too often overlooked and lead to big irritations.

Happily, *Daisy* seems to be amazingly free of such oversights. The many features of *Daisy,* combined with its ease of use and carefully presented documentation, make it well worth $74.95. If you have a need to prepare highly technical documents, or just long, nontechnical ones, *Daisy* supplies just about everything you could need. Its special features will also come in handy for many other sorts of work.

If you are looking for a program that will expand *Scripsit* into a professional word processor capable of producing highly technical texts with ease, and you don't care about right-justified proportional print, then buy *Daisy.* ☐

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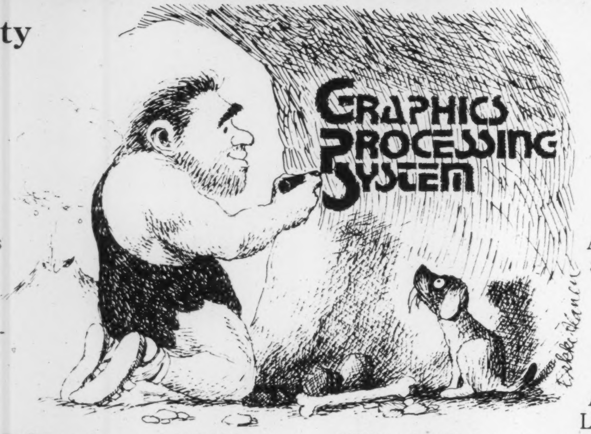

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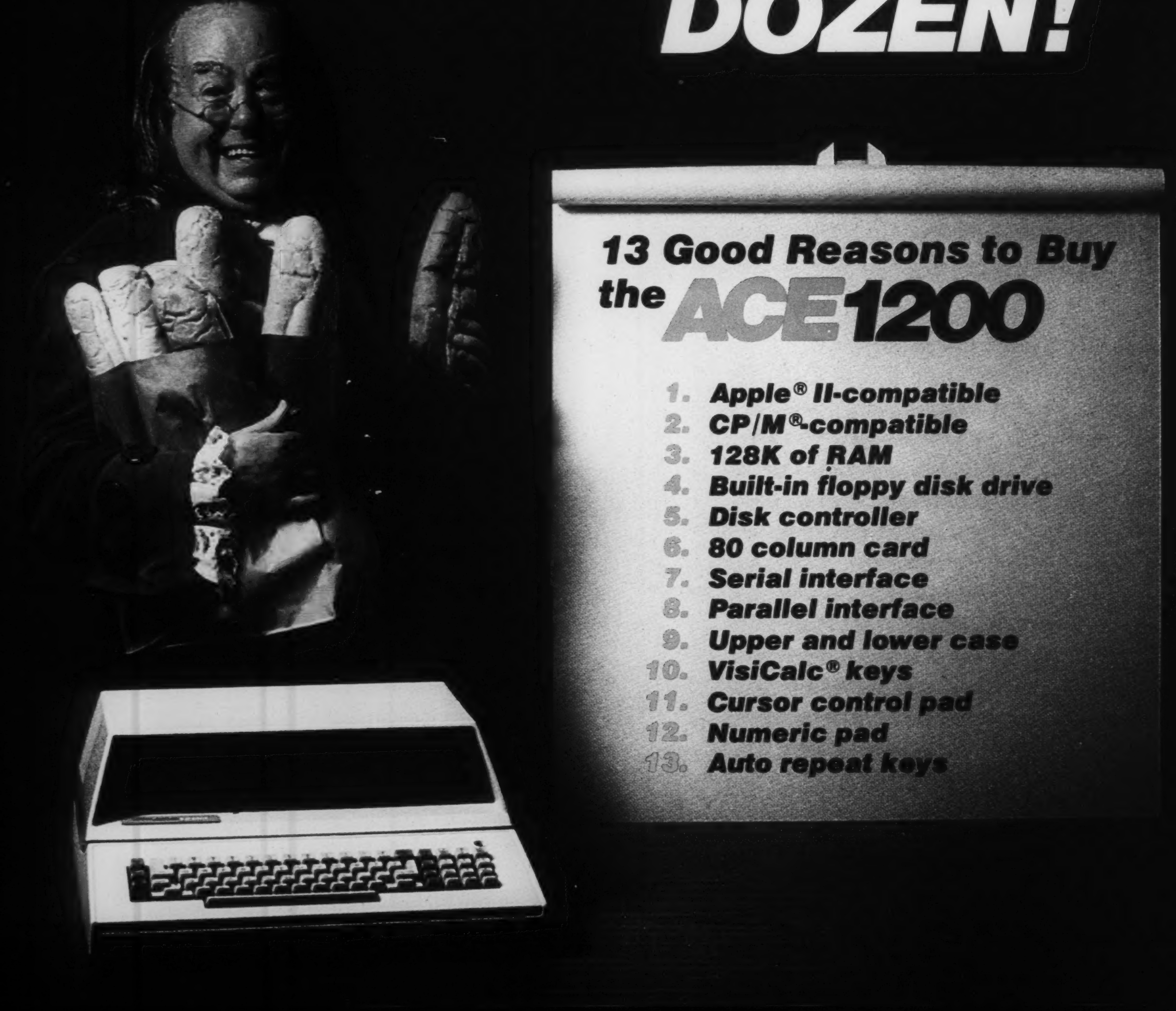

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CIRCLE 168 ON READER SERVICE CARD

MagicPrint

Glenn A. Hart

There are now dozens of word processing programs available for various microcomputers. Costing from only a few dollars to over a thousand, the features and capabilities of these programs cover just as wide a range.

One of the first word processing programs to gain wide recognition was MicroPro's *WordStar*. Designed to operate on the 8080/Z80 family of microprocessors, *WordStar* has been upgraded over the years and is now a stable, proven product. In fact, some people even refer to *WordStar* as the Cadillac of word processors.

While *WordStar* has an impressive array of editing and printing features, there are many things which *WordStar* does not include, some of which have been incorporated into competitive products. *WordStar* is, nonetheless, so popular that a family of "add-on" products has grown up to add various special features to the *WordStar* kernel. Among the abilities lacking in *WordStar* that independent software packages can add are generation of a table of contents and/or index, creation of footnotes, spelling verification, and grammar and syntax scanning.

Another feature missing from *WordStar* is true proportional printing. Modern daisywheel and thimble printers like the Diablo, Qume and NEC Spinwriter are capable of moving the printhead in very small increments, usually 1/120th of an inch horizontally. *WordStar* and other word processors use this ability to spread characters out for right justification (even right margins). This usually looks much better than merely inserting spaces between words to line up the right margin, as is necessary with printers that can print only in even columns like a typewriter.

The process of calculating the many small incremental movements and determining how words are placed to form a complete line involves complicated procedures. There are many ways to do this, and the method chosen has a major impact on how the printed output looks.

WordStar performs such "micro-space justification" reasonably well. However, it assigns each character about the same width, as a typewriter would (subject to some minor adjustments). With most type elements this is fine, although even with such standard daisywheels the algorithms used by *WordStar* do not result in printed output as attractive as that obtained from some other word processors.

Special wheels which use a different type style are available. Wide characters such as M, m, W, w, @, and others can be significantly wider than they could be on a standard type face. Other characters can also be adjusted for attractive appearance and consistency. Such "proportional spacing" wheels don't look right when used with *WordStar* because the wide letters run into their neighbors.

Programs with *true* proportional spacing vary the horizontal movement of the printhead based on the actual width of the character to be printed on the specific wheel in use. This is similar to the old IBM Executive typewriters, and results in much more attractive output that can approach typeset quality. From the program designer's point of view, however, true proportional printing adds greatly to the complexity of the output routines. Each character must be looked up in a table of width values specific to the print wheel in use and various adjustments must be made.

WordStar does not officially support true proportional printing of this sort. There is an unsupported method of coming close to it, which involves inserting a Control-P at the beginning of the file to be printed and making sure that *every* line of the file has been reformed with the Control-B command. This procedure is awkward at best, and while printing quality does improve, *WordStar* still uses its normal line forming algorithms so even after all this the output is not truly proportional.

MagicPrint

A new program called *MagicPrint* adds true proportional spacing and many other features to *WordStar*. Written by Computer EdiType Systems of New York and distributed by Lifeboat Associates, *MagicPrint* works with Diablo and Qume printers. An NEC version should be out by the time this article appears, and a version is also available for *Electric Pencil* users.

MagicPrint is a free standing print program. Text files are prepared with *WordStar* as always, except that a new set of commands is imbedded in the file in lieu of the normal *WordStar* dot commands (which are now ignored). The standard *WordStar* control characters for boldface, underlining, and other enhanced printing work normally for the most part, although there are some operating differences and enhancements. *MagicPrint* also adds other features including automatic footnoting, multiple-line headings and footings and some others we'll discuss shortly. Once the file is entered and edited, *MagicPrint* is used to print the file; the normal *WordStar* routines are not used at all.

Glenn A. Hart, 51 Church Rd., Monsey, NY 10952.

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MicroCom, Microterminal		$ 100	$ 65
MicroStuf, Crosstalk		$ 195	$129
NORELL DATA, System Backup		$ 50	$ 39
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* **DATAMOST**, Pig Pen or Space Strike, each		$ 30	$ 22
DAVIDSON, The Speed Reader		$ 75	$ 55
INFOCOM, Deadline		$ 50	$ 39
Zork I or Zork II or Zork III, each		$ 40	$ 29
* **INSOFT**, WordTrix	NEW!	$ 35	$ 29
QuoTrix	NEW!	$ 35	$ 29
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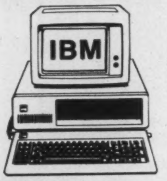

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* Quadboard, 256K, four function board	$ 995	$670
Quad 512+, 64K plus serial port	$ 475	$325
Quad 512+, 256K plus serial port	$ 895	$595
Quad 512+, 512K plus serial port	$1295	$895
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Microfazer, w/Copy, Par/Par, 64K, #MP64	$ 299	$235
Microfazer, w/Copy, Par/Par, 128K, #MP128	$ 445	$345
Microfazer, Snap-on, 8K, Par/Par, Epson, #MEB, w/PSI	$ 159	$145
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SSM, Transcend 1 for Apple II Data Comm.	$ 89	$ 69
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212 Apple Cat	$ 725	$599
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Stock Smartmodem (RS-232)	$ 289	$225
Smartmodem 1200 (RS-232)	$ 699	$535
Micromodem 100 (S-100 bus)	$ 399	$275
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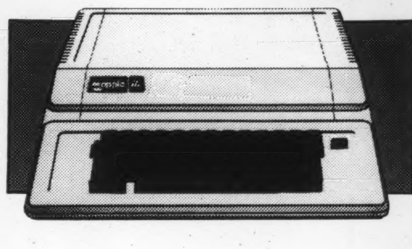

APPLE IIe 64K, 40 COLUMN	$1,175
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★ **ALS**, ADDRam	16K	$ 99	$ 69
★ **Microsoft**, RAMCard	16K	$ 100	$ 79
★ **Saturn Systems**, RAM Card	32K	$ 249	$169
RAM Card	64K	$ 425	$319
RAM Card	128K	$ 599	$459
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Color II	$ 179	$139
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CCS, Serial Interface 7710A	$ 150	$129
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Select-A-Port (II+)	$ 60	$ 45
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A.L.D.S.	$ 125	$ 75
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Cobol 80	$ 750	$559
Fortran 80	$ 195	$149
TASC Compiler	$ 175	$159
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Videx Videoterm, 80 column card	$ 345	$229
CCS, Serial Interface 7710A	$ 150	$129
Centronics Interface 7728	$ 110	$ 85
Calender Clock 7424A	$ 120	$ 95
Centronics Interface 7720B	$ 120	$ 95
Micro Pro, WordStar® (CP/M)	$ 495	$180
MicroCom, Micro Courier	$ 250	$125
Micro Telegram	$ 250	$125
Candor, Condor Jr. for ALS Smarterm (CP/M)	$ 195	$ 50

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The *MagicPrint* control character commands are listed in Table 1. These control characters are imbedded in the text, and most of them work just as they normally would, except that they are cleared at the end of a paragraph. This eliminates the need to put a closing character after short lines and avoids unintentionally printing an entire document in an enhanced mode.

Table 1. MagicPrint *Embedded Commands.*

Control-An (n=0-9)	Variable pitch
Control-B	Boldfacing
Control-C	Halt for wheel change
Control-D	Double strike
Control-E	Footnote start/ end
Control-F	Print cent-sign
Control-G	Print "non-sign"
Control-H	Accenting
Control-L	New page
Control-N	Reset command
Control-O	Non-break space
Control-R	Justify partial line
Control-S	Underlining
Control-T	Superscript
Control-V	Subscript
Control-X	Overstrike
Control-Y	Ribbon color change
Control-carat or Control-underscore	Soft hyphen

Two modes of underlining are available—the normal *WordStar* style of underlining only characters (not spaces) and solid underlining. *WordStar* allows only two predefined printing pitches without using a dot command; *MagicPrint* provides ten increments. This is used for the *local* adjustments called "kerning" by typographers. The only totally new commands are Control-R, which is used to justify partial lines, and Control-L, used as a replacement for the .pa command in *WordStar* to indicate an unconditional end-of-page and Control-E for footnoting, which will be examined later.

MagicPrint uses "comma" commands in place of the *WordStar* "dot" commands (see Table 2). As in *WordStar*, the command character, now the comma, must be placed in the *first* column on the left, followed by the specific command desired. *MagicPrint* defines two classes of comma commands—"stable" commands, not affected or reset by carriage returns or the Default command, and "transient" ones which are.

The Commands

Reviewing the commands in alphabetical order, Backline is a negative linefeed, used for certain hanging paragraph and outline formats as well as for two-column printing. The *MagicPrint* Center command can specify a number of lines to center, but it does not actually center them on the screen. The algorithm used is noticeably superior to that used by *WordStar*, and works perfectly in the proportional spacing mode (*WordStar* doesn't handle centering correctly in its quasi-proportional mode).

Default restores transient command values to the default status in effect when the program is invoked (these default values can be changed by an experienced user with DDT). The Even command places short lines flush with the right margin on either even or odd numbered pages and is useful for headings or footings when double sided pages will be bound.

The F command controls whether the program pauses after printing a page for single sheets or prints continuously for fan fold paper. This command overrides the user's choice when *MagicPrint* begins printing. G sets the page length in terms of the number of lines which will be printed, while GG sets the overall length of the paper in lines. The cHaracter command changes pitch, similar to the *WordStar* .CW instruction. Indent moves the beginning of a line to the right a specified number of columns.

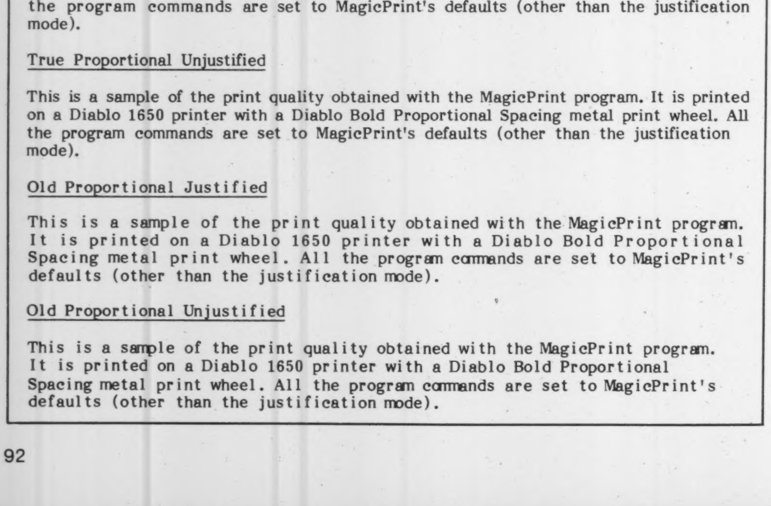
MagicPrint can output text in four spacing styles—true proportional or "old" (*WordStar*) proportional, either right justified or not. Figure 1 shows an example of each. Line sets the line length—normally 77. Note that true proportional printing puts many more characters on a line than normal printing (the exact number depends on which characters the line contains), hence the seemingly long line length.

Margin sets the left margin. There isn't any right margin command per se; the W command serves as a sort of "right indent" instead. N0 ejects the page, useful if for some reason the Control-L can not be imbedded in the text. The other N commands are conditional paging statements, useful in ensuring that text segments are not split over page boundaries. *MagicPrint*, incidentally, automatically avoids annoying orphan sentences (the final sentence of a paragraph on the first line of a page) by extending its page length to include the orphan with its paragraph. Outdent is used in outline-type formatting.

The various Page numbering commands are more flexible than those of *WordStar* and are quite useful. Rightflush moves the end of a partial line to the right margin. This is surprisingly convenient in placing page numbers and the like. Spacing adjusts the spacing between lines and allows half spacing (one and a half blank lines between text, for example). Underline determines whether the underlining will be continuous or broken. Vertical controls the width between lines in 48ths of an inch. Width indents the right margin.

Two special commands, # and *, are used for setting up the heading and/or footing used on a page. The pound sign is used when the page number is to be included and the asterisk when it is not. Unlike *WordStar*, *MagicPrint* allows multiple lines to be defined for headings and footings, and the center and rightflush

Figure 1. MagicPrint *Output Examples.*



True Proportional Justified

This is a sample of the print quality obtained with the MagicPrint program. It is printed on a Diablo 1650 printer with a Diablo Bold Proportional Spacing metal print wheel. All the program commands are set to MagicPrint's defaults (other than the justification mode).

True Proportional Unjustified

This is a sample of the print quality obtained with the MagicPrint program. It is printed on a Diablo 1650 printer with a Diablo Bold Proportional Spacing metal print wheel. All the program commands are set to MagicPrint's defaults (other than the justification mode).

Old Proportional Justified

This is a sample of the print quality obtained with the MagicPrint program. It is printed on a Diablo 1650 printer with a Diablo Bold Proportional Spacing metal print wheel. All the program commands are set to MagicPrint's defaults (other than the justification mode).

Old Proportional Unjustified

This is a sample of the print quality obtained with the MagicPrint program. It is printed on a Diablo 1650 printer with a Diablo Bold Proportional Spacing metal print wheel. All the program commands are set to MagicPrint's defaults (other than the justification mode).

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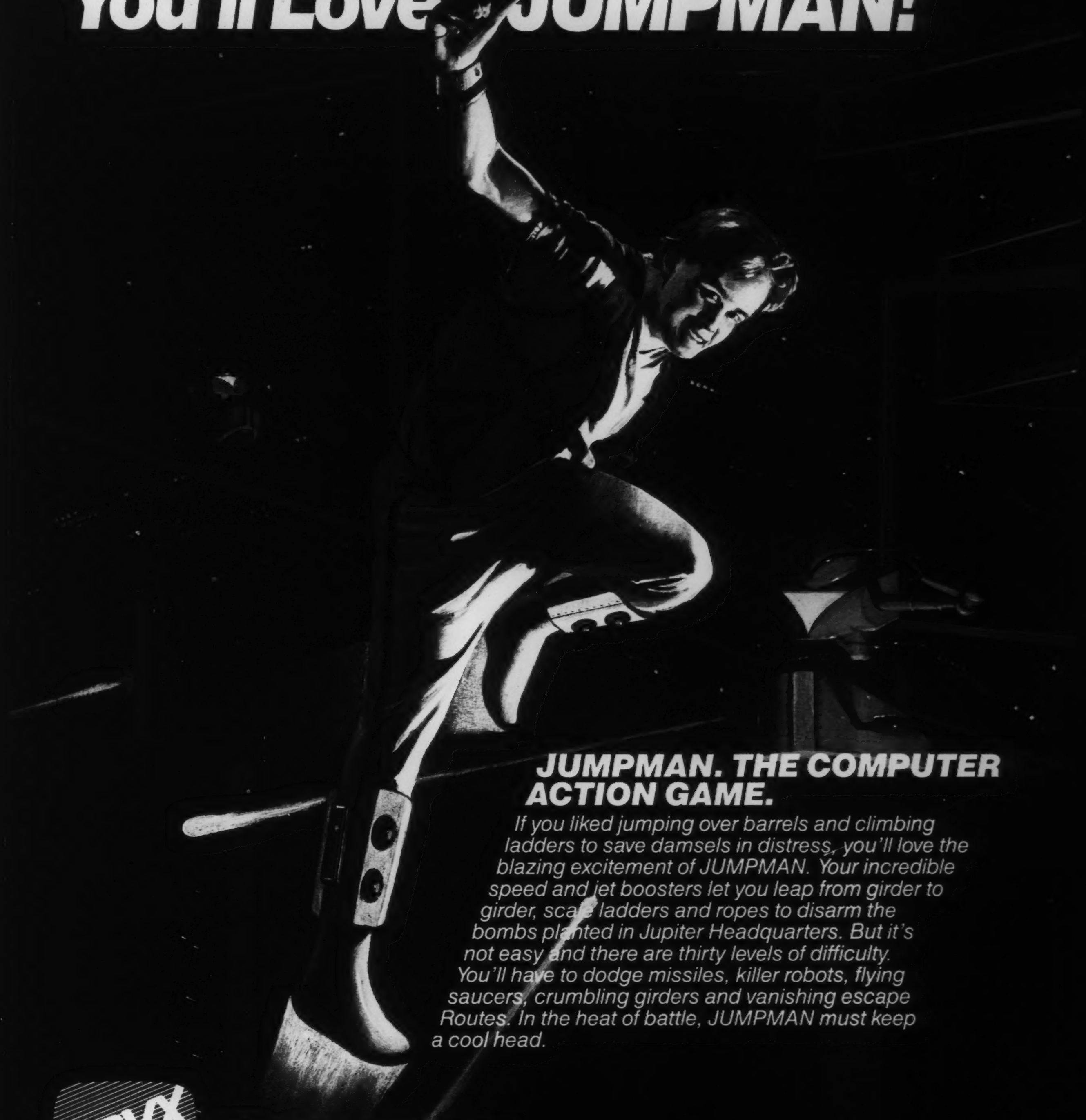

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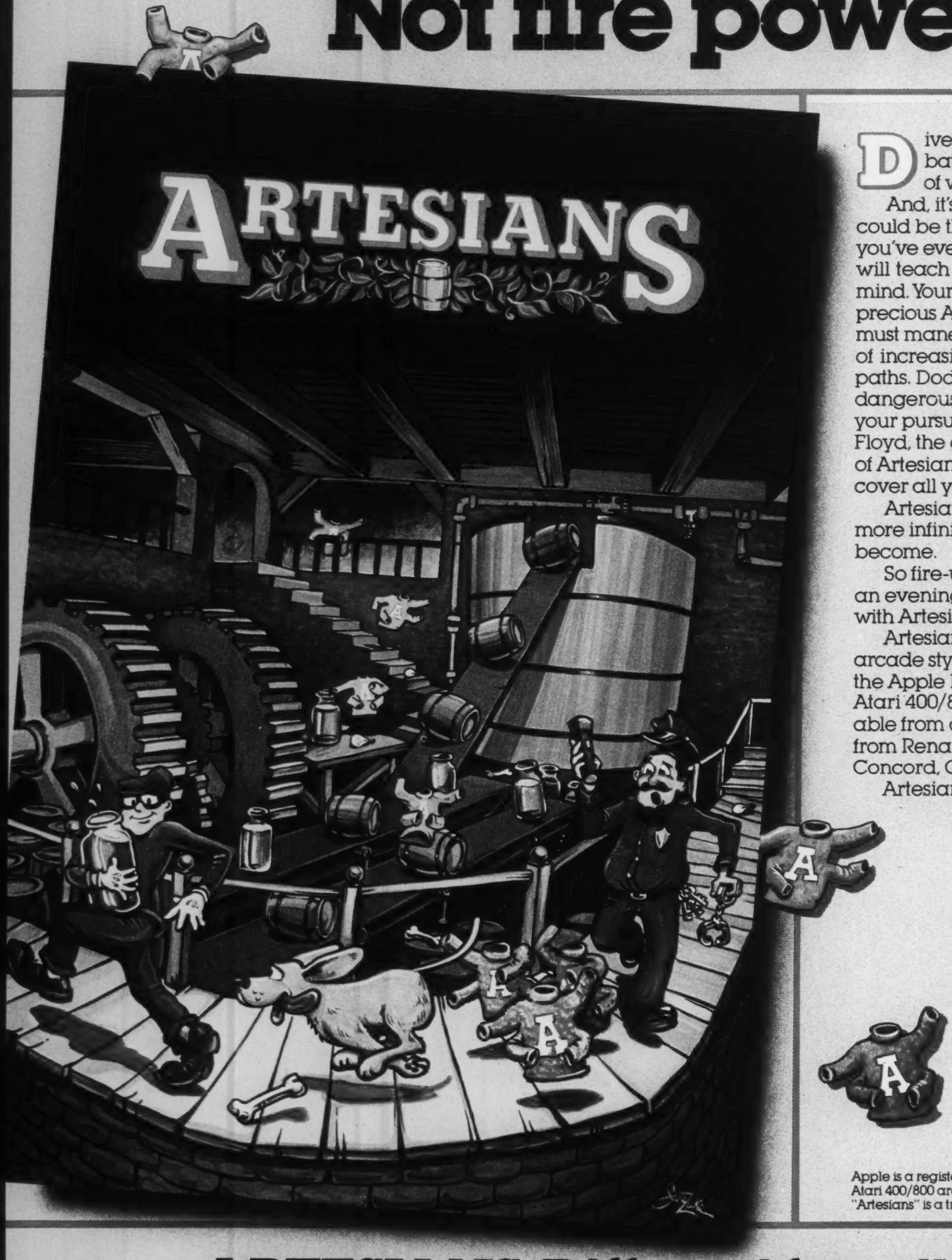

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Artesians. The more you play, the more infinite the complications become.

So fire-up your brain power for an evening of action. And match wits with Artesians.

Artesians is a high resolution arcade style video game written for the Apple II, Apple II+, and the Atari 400/800 home computer. Available from computer stores or direct from Rena-Soft, 1070 Shary Circle, Concord, CA 94518. (415) 676-5757

Artesians. $34.95. Requires 48k.

Rena-Soft

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Table 2. MagicPrint Comma Commands.

B	Backline
C	Center lines(s)
C	Center 1 line
C+	Turn on centering
C-	Turn off centering
C0	Same as C-
Cx	Center x lines
D	Default values restored
E	Rightflush partial line
E-	on even page numbers
E+	on odd page numbers
F	Page pause control
F0	Continuous printing
F1	Pause after each page
G	Set printable page length in lines
GG	Set gross page size in lines
H	Change character density
I	Indent the line on the left
J	Justify right margin
J0	true proportional unjustified
J1	true proportional justified
J2	old proportional unjustified
J3	old proportional justified
L	Set line length
M	Set left margin
N0	Same as Control-L
N+x	Move to next page if more than x lines in current paragraph
N-x	Move to new page if less than x lines in current page.
O	Outdent first line of a paragraph
P	Set (change) page number
Px	Start page number with x
P0	Postpone page numbering until next page
P0x	Start page number with x from next page
P-	Turn off page numbering
P+	Turn on page numbering
R	Rightflush the line
S	Sets line spacing Plus symbol (+) adds half time
U	Broken or solid underline
U0	make the underline broken
U1	make the underline solid
V	Set width between lines
W	Width if line reduced on right (right indent)
RETURN	Halt printing
#	Page number format symbol
#T	Page number on top of page
#B	Page number on bottom of page
#T0 or #B0	Defer page number to next page
)	End of page numbering format block
*	Page title format symbol
*T	Page title on top of page
*B	Page title on bottom of page
*T0 or *B0	Start title from next page
)	End of page title format block

commands, in conjunction with backline, allow some very nice page formatting.

Finally, *MagicPrint* handles automatic footnotes very well. The text of the footnote itself is surrounded with Control-E characters, and the program places the footnote at the bottom of the page, separated from the normal text by a line. Footnotes too long to fit on the bottom of the page are carried over to the bottom of the next page. There is no provision to accumulate footnotes for printing at the end of the document.

Once everything is set, *MagicPrint* is invoked by simply entering "magic," in which case the program asks what file you want to print, or by "magic filename" if you already know. Using the R option from the *WordStar* main menu to run *MagicPrint* makes it just about as easy to call up *MagicPrint* as it is to use the *WordStar* printing routines. The program asks if continuous printing or pausing after each page is wanted (the answer to which will be overridden if the appropriate command is in the text file itself) how many copies are needed and on what page to start printing. There is no provision for specifying what page to stop on, but this is easily handled by hitting a key while the program is printing.

Evaluation and Summary

MagicPrint works exactly as claimed. Every command does what it is supposed to, and printing proceeds quickly and cleanly. Informative error messages appear if there is any problem in the file or in the commands which have been entered. The tremendous improvement in the quality of the printed output is obvious.

Also on the plus side are the special features *MagicPrint* adds to *WordStar*. The new centering provisions and multiple line headers/footers are excellent, as is the increased flexibility in page numbering and titling. Footnotes are handled perfectly within the limitations of the method.

There are some major drawbacks, however. One of the advantages of *WordStar* is the ability to see a reasonable representation of what the printed output will look like on the screen. While *MagicPrint* has several features which make one miss this a bit less than might be imagined, it is not uncommon to have to print a document, reedit and reprint to get things just right. With familiarity, the number of surprises goes down, but occasionally something unforeseen will occur. This is especially true with outlines and other text which needs columnarization or fancy indentions. To some degree, this is a function of the constraints that true proportional spacing imposes, and thus the extra work required for perfection is partially a price that must be paid for the improved appearance of the output.

MagicPrint has no provision for merging data files into form letters, including other text files, at print time or any of the other features of MicroPro's *MailMerge* module with which most copies of *WordStar* are sold. The author of *MagicPrint* is working on a *MailMerge* type program which is designed to do everything *MailMerge* does and more, but for the moment *MagicPrint* can not be used for such functions.

Finally, *MagicPrint* is rather costly at $195 retail. As always, each potential buyer must judge whether the benefits of the program justify the cost. One obvious consideration is the ability to use a proportional printwheel. Not all letter quality printers can, especially since Diablo sells true proportional wheels only in metal.

A large part of the answer probably lies with how much of a perfectionist the user is. Some other word processors can print better looking documents than *WordStar*, and *MagicPrint* can match or exceed the best of them. Anyone who has been using the pseudo-proportional features of *WordStar*, with all its aggravations, in search of better quality will *love MagicPrint*. Lawyers, ad agencies, and others whose main product is printed material should examine the program carefully. It may seem that *MagicPrint* is an expensive addition to an already expensive word processor, but I, for one, wouldn't want to do without it. □

Apple Writer Extended

Paul Bonner

The first word processing program I ever used was *Apple Writer*, and I fell in love with it immediately. Okay, maybe it was puppy love, since I had never seen a word processing program before. For a writer who relies as heavily on multiple revisions as I do, any word processor would seem like a gift from heaven. Still, I loved the simplicity of *Apple Writer*, and the fact that I could begin with nothing more than a scant knowledge of the cursor control keys and produce a decent looking product. Then, when I began to learn how to use the search-and-replace feature, and the insert and block move features, I was enthralled.

***I loved the simplicity of* Apple Writer.**

Later I was introduced to another, supposedly far more powerful and sophisticated, word processing program. I had to admit that it had all kinds of features I had never dreamed of, including 80-column display (although at the cost of buying an 80-column board), paragraph modes, automatic word-wrap, auto-indent, and editing of Applesoft and DOS text files.

But as hard as I tried, I just couldn't get the hang of the new program. There were so many commands to be learned that I spent half my time with my nose in the user's guide, and the other half trying to recover from my mistakes. Which didn't leave much time for keeping a train of thought moving.

Nevertheless, when I bought my own Apple, I thought seriously about buying another word processing program. I was constantly frustrated by not being able to issue text-imbedded printer commands from *Apple Writer*. With Graftrax, my MX-80 has 20 type styles available, and I could use only one at a time. Since my primary source of income involves writing technical articles with a good deal of boldface and italicized type, I was forced to print out my copy in normal print, and then spend half an hour underlining or circling phrases that were to be set in an alternate typeface.

creative computing

SOFTWARE PROFILE

Name: Apple Writer Extended

Type: Enhancement program for AppleWriter word processor

System: Apple II 48K, Apple Writer

Format: Disk

Language: Machine

Summary: Adds much-needed features to a classic word processor.

Price: $34.95

Manufacturer:
Brillig Systems
10270 Fern Pool Ct.
Burke, VA 22015

So I considered other programs, but I really wasn't comfortable with any of them. I was in a quandary.

Then I saw a small advertisement for something called *Apple Writer Extended*. It promised to add all the features I wanted to *Apple Writer*, and it was cheap—discounted to less than $30. Since it wasn't much of a risk, I ordered it. It arrived a few weeks later on a single disk containing 21 short routines.

The documentation instructs you to transfer the routines to a disk already containing the TEDITOR, PRINTER (which you rename Print 2), and PRINT CONSTANTS files. After doing that, and making a change in the printer address, you are ready to go.

Text Formatting

The most important routine as far as I am concerned is the printer text formatting program. Called PRINT EXIT on the *Apple Writer Extended* disk, this routine augments the original PRINTER routine to allow you to issue printer commands from within an *Apple Writer* file. This capability is accessed by entering the @ character, followed by a lowercase x. The next character you enter (in hex code) is interpreted as a printer command at print time. 9b following the @x sequence interprets the next letter as an escape character.

I find this very useful, since with

Paul Bonner, 327 Sterling Pl., Brooklyn, NY 11238

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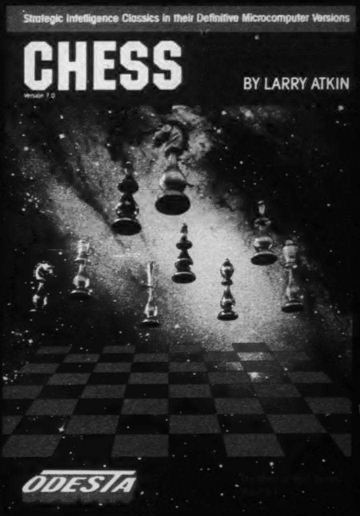
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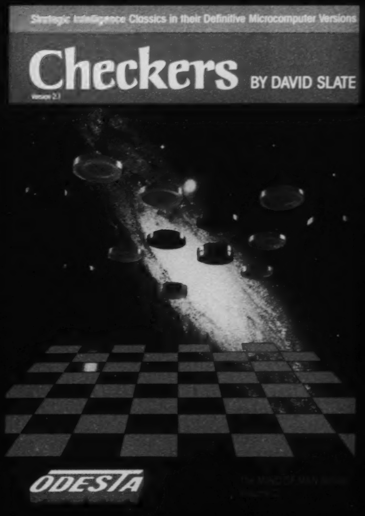
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CIRCLE 218 ON READER SERVICE CARD

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Graftrax all printer commands are escape sequences. Once you have determined the proper commands for your printer, you can save them to disk and then insert them wherever you want with a CONTROL-I (insert) command.

The PRINT EXIT routine has other useful features, including the ability to override or add spaces in fill-justify mode, to underline text, or to print boldface text by backspacing and restriking. In addition, you can send a formatted copy of a file to disk rather than to the printer.

The formatted file may contain variable-length spaces for insertion of data from other files, allowing you to produce form letters or update reports with relative ease. This feature also allows you to view formatted text on the screen as it is being sent to disk by issuing a MON C,I,O command before you run the printer.

Text File Utilities

In addition to print formatting, there are some excellent text file utilities included with *Apple Writer Extended*. With these you can edit text files, convert existing *Apple Writer* files to text files or vice versa, and convert Applesoft files to *Apple Writer* files and then back to Applesoft. This allows you to take advantage of the powerful features of TEDITOR while writing and editing Applesoft programs.

For example, suppose your favorite computer magazine contains a program or game listing in a version of Basic that makes heavy use of print-using routines, or other commands that Applesoft doesn't recognize. Normally you must change these as you enter them, and are subject to formatting errors for your trouble. With the text file editing feature you can enter the program as it appears and work out separate formatting subroutines for each print-using routine. Then it's a simple matter to use the search feature to replace each print-using or PRINT @ statement with a GOSUB X. And of course, in writing programs, there are obvious advantages to having a search feature to keep track of or globally replace your variables, and a block relocating feature to move subroutines.

There are other goodies too. You can list *Apple Writer* files on the screen, and use your game paddles to control the scrolling speed. There is also a reset intercept subroutine that can be used with any program to print an error message when RESET is hit and then return to the program. Finally, SHIFT-N and ESCAPE SHIFT-N can be used to produce the underline character and the vertical bar, which are useful for designing forms, and are not normally available from the Apple keyboard. Those characters will appear only when you print the file. On screen they will continue to appear as ^.

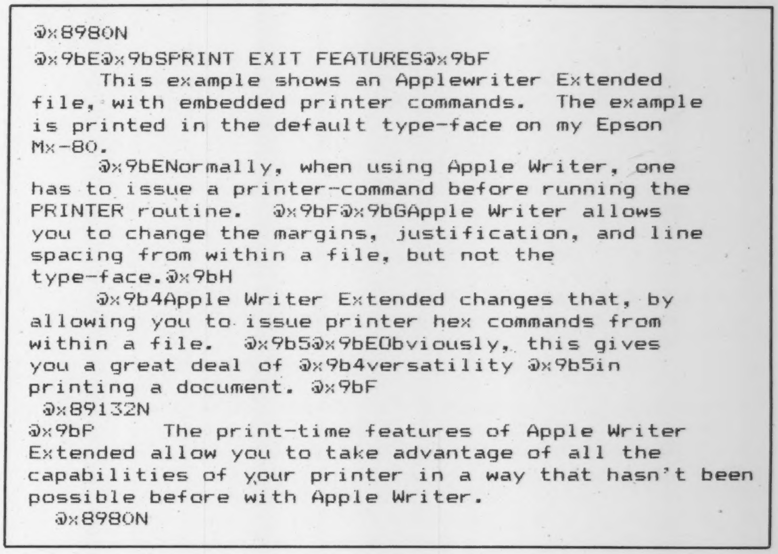
Documentation

The documentation is one great deficiency in this package. The instructions for using each routine are scattered through a 14-page booklet, making them utterly incomprehensible at first. However, by reading through the main documentation and the three appendices a few times, and playing with the routines for a while, you can eventually divine the use of most of them.

That's about it. This program does wonderful things for *Apple Writer*. Of course, it doesn't make it a "professional" text processor for an office environment. You still have limited screen formatting, a 40-column display, and no automatic word-wrap. The form letter capabilities, although vastly improved, also remain limited. I use it to prepare articles for typesetting, to write letters, and for program editing. For those uses, it is just fine. Better documentation would definitely help, but as it is, *Apple Writer Extended* is a great value, and well worth the time it takes to figure out how to use it. ☐

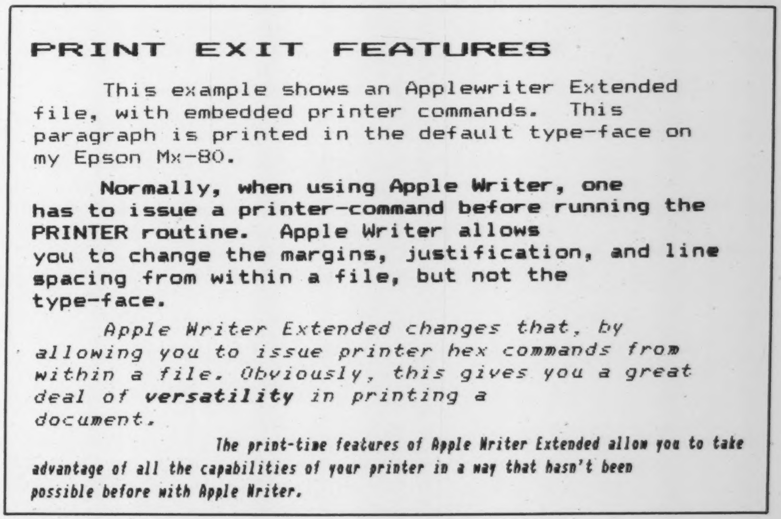
CIRCLE 406 ON READER SERVICE CARD

Figure 1.



```
@x898ON
@x9bE@x9bSPRINT EXIT FEATURES@x9bF
     This example shows an Applewriter Extended
file, with embedded printer commands.  The example
is printed in the default type-face on my Epson
Mx-80.
     @x9bENormally, when using Apple Writer, one
has to issue a printer-command before running the
PRINTER routine.  @x9bF@x9bGApple Writer allows
you to change the margins, justification, and line
spacing from within a file, but not the
type-face.@x9bH
     @x9b4Apple Writer Extended changes that, by
allowing you to issue printer hex commands from
within a file.  @x9b5@x9bEObviously, this gives
you a great deal of @x9b4versatility @x9b5in
printing a document. @x9bF
 @x89132N
@x9bP     The print-time features of Apple Writer
Extended allow you to take advantage of all the
capabilities of your printer in a way that hasn't been
possible before with Apple Writer.
  @x898ON
```

Figure 2.



PRINT EXIT FEATURES

This example shows an Applewriter Extended file, with embedded printer commands. This paragraph is printed in the default type-face on my Epson Mx-80.

Normally, when using Apple Writer, one has to issue a printer-command before running the PRINTER routine. Apple Writer allows you to change the margins, justification, and line spacing from within a file, but not the type-face.

Apple Writer Extended changes that, by allowing you to issue printer hex commands from within a file. Obviously, this gives you a great deal of ***versatility*** *in printing a document.*

The print-time features of Apple Writer Extended allow you to take advantage of all the capabilities of your printer in a way that hasn't been possible before with Apple Writer.

Listmaker, Listmaker, Make Me A List

Gordon McComb

List management programs help you create and store—are you ready for this?—lists. More than that, they allow you to search through your lists to find specific information about the people, places, or things of which you are keeping track. And if the list program is a good one, it will allow you to do something such as create personalized form letters, print mailing labels, or develop an alphabetized phone directory, with all the information you have compiled.

The software publishing arm of *Reader's Digest* recently introduced an inexpensive program called *Listmaker* for the TRS-80 Models I and III, Apple II, and IBM Personal Computer that lets you do all of these things.

What sets *ListMaker* apart from most other list managers is that it can create "merge-printed" documents by automatically inserting a string of information into the proper places in a form letter. Merge printing is typically found only on expensive word processing programs or special "document handling" software.

How would you use *ListMaker*?

For a business, *ListMaker* can keep mailing lists of clients, employees, or subscribers; send personalized form letters to customers, vendors, sales prospects; print mailing labels; and develop customers, information files which can be sorted by zip code, type of business, alphabetically, by state, etc.

Schools and clubs can use *ListMaker* to maintain student lists and code them by bus route, grade reports, parent information, health information, etc.; send personalized letters; create inventory lists; and compile class, member, or group statistics for reports.

In the home, *ListMaker* can maintain a directory of frequently used services (repair, babysitting, etc.), develop a home property inventory, or compile a monthly bill register, complete with due dates and mailing labels.

In short, *ListMaker* can be used whenever a modest amount of data must be stored, sorted, and retrieved. Since you specify the way the information is to be presented, you can use it for just about any application, from simple list printing to completion of complicated forms.

Keep in mind, however, that businesses, schools, and clubs with over 500 names to track may find *ListMaker* a bit limited. *ListMaker* can handle large numbers of records, of course; its limitation is that it lacks the sophisticated multi-level sorting capabilities often required when working with long lists. A more highly structured database management program would be better suited for that job.

Overview

ListMaker comes on floppy disk only. For this discussion, we will examine the use of *ListMaker* with the TRS-80 computers.

The standard Radio Shack TRSDOS disk operating system is on the program disk when you receive it from Reader's Digest. You need only power up your system and slip the disk into the drive to start work. And since you buy the program for either the Model I or the Model III, there is no disk conversion required.

ListMaker is menu driven, and to a great extent, interactive. Upon loading the program, you are greeted by an option menu that allows you to perform *ListMaker* related functions, and some disk utility routines, including Format Data Disk and Disk Contents (otherwise known as a Directory).

After you have entered *ListMaker*, you can perform four basic functions:

- You can create and store a list of

creative computing

SOFTWARE PROFILE

Name: ListMaker

Type: List manager

System: TRS-80 Models I/III, Apple II, and IBM PC

Format: Disk

Summary: Very good list manager/mail-merge utility.

Price: $97.50

Manufacturer:
Reader's Digest Services, Inc.
Microcomputer Software Division
Pleasantville, NY 10570

Gordon McComb, 1225 Palomar Pl., Ste. 100, Vista, CA 92083.

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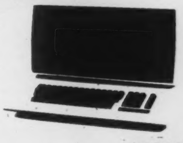

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people, places, things, or whatever you want. Each separate item in the list must contain the same type of information, however. You cannot throw data into the list files haphazardly and expect *ListMaker* to shuffle through it.

- You can sort through your lists and have *ListMaker* find specific items of interest. It can store the sorted list for later use if you wish. This sorting capability is one of the most powerful features of the program.
- You can have *ListMaker* print out your list—either all or part of it. If you want a sorted list, you can print out only selected entries or selected portions of each entry. For example, you can ask *ListMaker* to sort through your list and pick out only those customers who have a telephone number with the area code of 212.
- You can place all or part of each entry into specific banks in a form letter. As mentioned before, this is called merge printing, and is an extremely powerful tool when used properly. You can instruct *ListMaker* to insert the name, address, salutation, account number, balance due, or other information you specify into a document. It will go through your entire list and create individualized letters in this fashion. If you want a sorted list, *ListMaker* will print letters to only those people who have satisfied the requirements of your sort. *ListMaker* will also sort your lists in alphabetical or numerical order.

Entering Data

The first order of business in using *ListMaker* is to create the list itself. You must first set up a *template* with which to work; *ListMaker* will not accept data without it. To create the template, you simply enter the various fields or categories you wish to include in the list. A field is one specific item, such as a last name, a phone number, an area code, a bus route, or a business title.

When the template is finished, you can start to enter data. You enter data in *records.* A single record contains all the various fields for one individual. That is, a record will have the name, phone number, area code, address, business title, and so forth for one person. That way, when it comes time to add, delete, or change your list, you can do so on a per person/per record basis.

ListMaker makes entering information a snap: Since you have already created the data template, *ListMaker* asks for the information one piece at a time. Some systems lack this feature and require you to enter a stockpile of data without prompting. It isn't hard to drop an important bit of information this way.

After the data entry is complete, you can review your handiwork to make sure you have made no mistakes. *ListMaker* provides for a search and change feature to correct problems.

Printing

If your aim is to create a mailing list or a stack of mailing labels, you need only instruct *ListMaker* to print out your list. The program will print out only that information you tell it to: such as name, address, and zip code, omitting company affiliation and phone number.

If your aim is to create a merge printed document, you must write the form letter that you wish to send. *ListMaker* includes its own simple word processor, so you can create letters without additional software. Unfortunately, the program will not communicate with other software, such as *Scripsit*, so you must use the somewhat limited text editor to write your documents. There is no fancy underlining, boldfacing, justified printing, or line centering available.

Like most other merge-printing programs, when you create a form letter, you assign each *variable* within the letter a special number. That number corresponds to the fields found in your list. When the form letter and list files are

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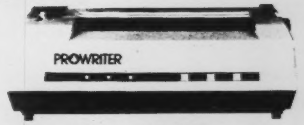

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combined, the program automatically inserts the contents of the fields into the marked spots in the form letter.

Sorting

There are several ways you can create a sorted list, one that contains only records of a specific type (area code 212, for example). One way is to create a new list using the List Split Option. This is a roundabout way of doing it, but with practice, it works nicely. You get a permanently sorted list, which comes in handy if you need to print out the sorted version often.

The easier way is to answer no when the program asks "want to print the whole list" when you are setting up the printing options. On answering no, *ListMaker* displays its Search/Change menu and offers you the choice of a text string search, an exact match search, or a single character search.

You might use the exact match search to look for 212 in the area code field. You can search for such things as last names that start with M, clients that have a zip code with the 0 in the middle of the number (10017), or just about anything else. *ListMaker* searches on one key only; you can't (without creating sub-sorted files with the List Split Option) ask it to search for all sales people who have an area code of 212 and with whose last names start with M.

When printing labels and lists, you can format the way the data will appear on paper. For example, if you are printing mailing labels, the program assumes you are using standard 3-1/2" by 7/8" mailing labels and formats the printout to fit within these boundaries.

If you are just printing out a list, you can tell *ListMaker* to skip one or more spaces between items. When printing out form letters, you can specify: the maximum number of characters per line, the position of the left margin, the length of paper, the maximum number of lines per page, whether you want a heading printed on each page, and whether you want to print continuously (presumably on fanfold paper) or pause between pages.

Summary

It is obvious that *ListMaker* is a powerful program, especially when you consider that it costs less than $100. On the whole, the program operates without problem and is easy to learn. The documentation is much better than average, but it isn't quite as good as I had hoped. I felt that a product coming from Reader's Digest would be more complete.

The manual is written for the computer novice in a tutorial format, which is fine, but it offers no advanced information other than a sketchy flow chart. For example, use of the List Split Option as a sorter was not discussed in the manual; rather the feature is explained as a way to cut an overly large list down to size. A complete, if not totally separate, reference manual would be welcome.

On the positive side, the manual comes with a nearly complete glossary and a quick reference section. The quick reference section is laid out by menu and explains what each menu item does. The manual contains both a complete table of contents and an index.

One item I look for in any list management program is the ability to create a fully merged document file (a file in which completed form letters reside), in addition to the standard merged document printout capability. Alas, *ListMaker* does not offer this useful feature.

Finally, because the program is menu driven and interactive, it is extremely easy to use. Even when I tried to enter erroneous data, the computer did not crash, nor was I dumped out of the program. Error handling was excellent. When trouble occurs, the program displays an error message in plain English. A section in the back of the manual further explains the error messages. □

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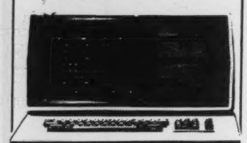

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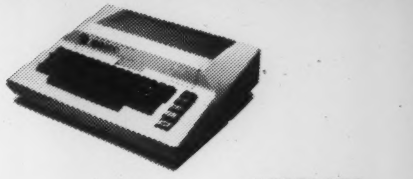

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CIRCLE 148 ON READER SERVICE CARD

LinkDisk, LinkVideo, LinkIndex

The Missing Links for Pascal

John J. Hirschfelder

Serious Pascal programmers, particularly those whose business programs involve data entry, will welcome three new products for the Apple from Link Systems.

LinkDisk, a disk manipulation utility; *LinkVideo*, a screen utility; and *LinkIndex*, a utility for rapid key retrieval are designed to facilitate program development in Pascal.

LinkDisk is a free-standing Pascal utility program which provides an assortment of disk maintenance functions absent from the Apple Pascal Filer: translation of DOS 3.3 binary and text files to Pascal files, comparison of files and volumes, examination and hexadecimal editing of disk files, and listing of text files on the printer. The operation procedures of *LinkDisk* are similar to those of the Apple Pascal Filer.

LinkVideo and *LinkIndex* are not complete programs, but packages of procedures (*units* in Apple Pascal terminology) which may be called from user-written application programs. They are intended for the serious programmer of data entry, storage, and retrieval applications for business—the programmer for whom time spent reinventing the wheel is money lost. The procedures of *LinkVideo* provide screen control functions and "operator-proof" input of common data items such as telephone numbers, social security numbers, and strings, and include some basic data validation. *LinkIndex* handles an index file associated with a user's data file, providing a capability comparable to the Indexed Sequential Access Method of Cobol.

Each of the three products is provided on a disk with a user's manual. All files on the disks may be readily copied for the use of the original purchaser using the Transfer function of the Pascal Filer.

creative computing

SOFTWARE PROFILE

Name: LinkDisk

Type: Disk manipulation utility with editing & printing features

System: Apple II 64K

Format: Disk (16 sector Pascal)

Language: Pascal P-code

Summary: Handy disk maintenance tool

Price: $69.95

Manufacturer:

Link Systems
1655 26th Street
Santa Monica, CA 90404
(213) 453-1851

LinkDisk

LinkDisk, the utility program, provides four groups of functions: DOS 3.3 file translation, file and volume comparison, file enumeration and editing, and listing.

With a DOS 3.3 disk in one of the disk drives, *LinkDisk* displays a catalog of the disk in either of two formats. One format is similar in content to the DOS CATALOG display but is arranged differently. The other format provides more information including, for binary files, the start address and length. Upon command, *LinkDisk* translates a selected text or binary file on the DOS 3.3 disk to a Pascal file on the disk in the other drive.

The Compare function of *LinkDisk* will compare, byte for byte, two Pascal files or two whole volumes, to determine whether a verbatim copy has been correctly made. It will also compare two DOS 3.3 disks.

The Examine function permits byte-by-byte display and editing of a Pascal file (or volume). One disk block is displayed at a time, with a byte-sized (two-character) cursor. Data can be displayed in ASCII, hexadecimal, or mixed. In ASCII display mode, non-printable characters are displayed as "?". In mixed mode, printable characters are displayed by their ASCII characters and non-printable characters are displayed in hexadecimal. Editing of a block display

---

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CIRCLE 130 ON READER SERVICE CARD

is done by using the standard Pascal cursor controls (left-arrow, right-arrow, ctrl-0, ctrl-L) and by typing corrections in hex.

> ***The List function is ideal for obtaining printed listings of large Pascal programs whose text extends over several text files.***

The List function is ideal for obtaining printed listings of large Pascal programs whose text extends over several text files. The user is presented with the directory of a volume from which he selects those text files he wishes to list. He may also specify whether he wishes files ordered alphabetically by name, by date, or in the order found in the directory, as well as the number of lines per page, whether or not pages are to be titled, and whether or not lines are to be numbered. Then the entire list of selected files is printed.

The *LinkDisk* user's manual is concise and well written. The program itself is mostly self-explanatory in its operation, so there should be little need to refer to the operating procedures after one reading. The procedure descriptions in the manual occasionally omit a prompt present in the program. For instance, the Select Option of the List function prompts for a unit number, which is not mentioned in the procedure. The manual also fails to mention that the disk volume supplied is named DISKS:. The experienced Pascal user will not be bothered by these omissions, but they may be annoying to a novice.

LinkVideo

LinkVideo is a package of fifteen Pascal procedures useful to the writer of data entry programs. One procedure, VDT (for Video Display Terminal) is called with one parameter which selects one of the following high level screen operations: home cursor, clear screen, clear the line that the cursor is on, erase from cursor to end of line, erase from cursor to end of screen, and move cursor up, down, left, or right.

The remaining procedures are output and input procedures for seven data types: string, phone number, Boolean, social security number, date, integer, and long integer. In each case, the calling program provides screen position (row and column). For string, integer and long integer, a field width is also provided by the caller. On input, the calling program provides a default value which is displayed. Then the operator is afforded an opportunity to change it.

Each character typed by the operator is checked for validity. Invalid characters are ignored, and the computer beeps. The cursor is constrained to the data field displayed and the first position to the right of it; no operator error short of hitting RESET will prevent a valid data item from being returned to the calling program when the operator types RETURN. Therein lies the principal benefit of this procedure package.

Punctuation in dates, phone numbers, and social security numbers is fixed and the operator can't change it; only significant digits are accepted. In the case of long integers, the calling program specifies the position of an assumed decimal point; the point is displayed, and the operator can't change it. The validity checking on dates is deficient. In the month field, the numbers 0 through 12 are accepted. In the day field, the numbers 0 through 31 are accepted and 40 and up are rejected, while days of 32 through 39 are garbled with no error indication.

creative computing

SOFTWARE PROFILE

Name: LinkVideo
Type: Keyboard data input utility
System: Apple II 64K
Format: Disk (16 sector Pascal)
Language: Pascal source code
Summary: Error-tolerant keyboard input utility
Price: $54.95
Manufacturer:
Link Systems
1655 26th Street
Santa Monica, CA 90404
(213) 453-1851

The user's manual, like that of *LinkDisk*, is concise and well written. It includes detailed descriptions of the procedures and their parameters, a discourse on the unit concept in Apple Pascal and the relative merits of regular and intrinsic units, and a procedure for installing the package in the SYSTEM. LIBRARY file. The procedure, using the LIBRARY program supplied with the Apple Pascal System, is entirely standard but long, so its complete presentation here is welcome even to the expert.

The procedure contains one error: the response to the NEW LINK CODE prompt should be VIDEO:VIDEO, not BLANK:VIDEO as stated in the manual. Again, the manual has failed to mention the name of the disk volume.

The disk supplied contains the complete source and object code for these procedures, the source and object code for an assembly language subroutine which it uses, and the source and object code for a demonstration program called TESTVIDEO. After installing the package in his library, the user should run the demonstration program to get an operator's feel for how these procedures work. He should then print and peruse the source code for both the demonstration program and the procedures. He will then be ready to write his own nearly foolproof data entry program with a minimum of effort.

LinkIndex

LinkIndex is the most sophisticated of the three products. It provides the serious business programmer with a capability in Pascal comparable to the Indexed Sequential Access Method (ISAM) in Cobol. *LinkIndex* is not an ISAM implementation; rather, it is an index file handler. The application programmer must do his own handling of his data file; *LinkIndex* won't touch it. Thus, while the index is invisible to the programmer in ISAM, it is highly visible in *LinkIndex*—but it is seen only through a set of procedures providing high level operations on the index.

To build a data storage and retrieval application using *LinkIndex*, the user sets up a random access data file, so that when he adds a record to his file, he knows its record number. Then he uses one of the procedures of this package, called EnterKeyInBTree, to place a key in the index. The key contains the record number of the newly created record and the value of a field in this record which the user wishes to use to retrieve the record. He may enter several keys for the same record. Then, when he wants to retrieve a record, he provides the key

creative computing

SOFTWARE PROFILE

Name: LinkIndex
Type: File-index handling utility for keyed record retrieval
System: Apple II 64K
Format: Disk (16 sector Pascal)
Language: Pascal P-code
Summary: Rapid key retrieval unit
Price: $195
Manufacturer:
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CIRCLE 104 ON READER SERVICE CARD

field value to another procedure, called KeyInBTree. This procedure provides the record number (or signals that the key can't be found). With the record number, the file operations SEEK and GET can be used on the data file to retrieve the record.

The complete set of procedures in this package is as follows: CreateBTree creates a new index file. OpenBTree opens an existing index file. EnterKeyInBTree inserts a new key in the index. RemoveKeyFromBTree removes a key from the index. GetNextKey finds the next larger key in the index (for sequential access in increasing order). GetPriorKey finds the next smaller key in the index (for sequential access in decreasing order). And CloseBTree closes an index file.

Actually, all but the last of these are Boolean functions, which return TRUE if the operation was successful and FALSE otherwise. If FALSE, a variable BTreeResult contains an explanatory code. CloseBTree always succeeds.

The user's manual, at 50 pages, is the most comprehensive of the manuals for the three products. It includes an introduction, a tutorial using a phone list program as an example, specifications of the procedures and their parameters, and a programming guide covering a variety of technical issues such as memory requirements, file space planning, and error handling.

Appendix A is a source listing of the interface portion of the package—unlike *LinkVideo*, source code is not provided. Appendix B is a brief but scholarly discussion of file access methods, including ISAM and the binary tree algorithms used in *LinkIndex*. Appendix C contains directions for installing the unit in SYSTEM.LIBRARY. It is similar to the comparable portion of the *LinkVideo* manual and contains the same minor error—the volume supplied is named LINDEX:, not BLANK:.

The disk supplied contains the code file for the unit, called BTREE.CODE; a text file, DOC.TEXT, containing additional documentation; and seven files relating to the phone list example including source code, object code, and data.

DOC.TEXT contains a listing of differences among versions, describing which bugs were fixed in which, guidance on file size and heap space estimating, and a discussion of the Apple III version. It also contains the specifications for the GetPriorKey function, which was added to the package after the manual was printed. The information on bugs in prior versions is especially welcome, as it indicates a continuing interest on the part of this vendor in supporting and improving his products.

LinkIndex is one of the most technically advanced software products for the Apple that I have seen. For the serious programmer of business applications, the effort required to understand and use this package will be repaid with improved program performance with less programming effort. ☐

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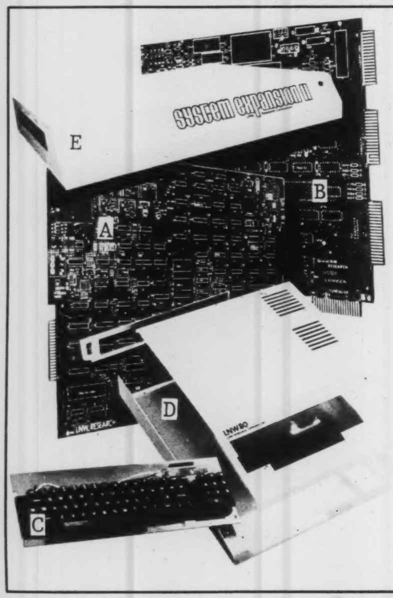

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An Alternative To The Atari 810

Winston Lawrence

Double density 5 1/4" disk drives for the Atari have finally arrived. Percom Data Company is now shipping Atari-compatible disk drives. I ordered one of these drives from my local Percom dealer as soon as I heard the announcement and within a week had one of the first drives in New York.

One of the biggest drawbacks to trying to use the Atari computer for business and serious programming has been the limited storage capacity of the single density 810 disk drives. The single density drive holds about 88,000 bytes (characters) of storage, which does not leave much room for data once programs have been stored on the disk. The double density disk drive from Percom allows approximately 176,000 bytes of storage.

The new double density disk drive from Percom allows approximately 176,000 bytes of storage.

The single unit disk is about 50% heavier than the Atari 810 drive and is encased in a solid metal enclosure. The drive stands about 6 1/2" high, by 4 1/2" wide and 11" deep. Two of these drives take the same amount of desk space as one 810 drive because the Percom drive is mounted vertically, while the Atari 810 is mounted horizontally.

The Percom drive comes with a manual which explains the installation and checkout of the drive system. My manual was marked Preliminary Copy and several sections were left blank with a notation that the information would be included in a later version.

Nevertheless, the actual installation of the drive was easy, and the manual did explain how to attach the drive to Atari computers with no other drives and to Atari systems with one or more 810 drives. The drive came with the familiar Atari connector cable and plugged in just like any other peripheral device.

It is important to note, however, that when the Atari system does include 810 drives, the Percom controller drive *must* be drive number one.

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Winston Lawrence, Wilaco Consultants Corp., P.O. Box 1272, Jamaica, NY 11432.

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Percom, continued...

The back of the Percom controller drive has two Atari connectors and a white 34-pin connector. This connector is used when adding additional Percom drives and will be very important in the future. It can be used by the controller to control additional 40-track double density drives, 80-track drives, and even 8" drives.

Only the first Percom drive must have the controller card installed. The controller can then control three additional drives. If you were to add two additional controller drives (each of which controls three add-on drives), you could have an eight-drive system in place of the maximum of four 810 drives.

Additional Percom add-on drives do not require the controller cards, so the cost of an add-on drive is $399--about half the cost of the $799 double density drive with the controller card.

The only hardware problem I have noticed is that the cassette recorder cannot be used with the Percom unit attached. I do not use cassettes very often, so this is not a big problem for me. When I do need it, I boot the disk, then pull the connector out of the computer console I/O port, and plug the cassette recorder in. I unplug the recorder when finished, plug the drive connector back in, and continue.

The Percom drive controller determines whether a disk is single density or double density during the boot process and switches to the correct mode of operation, making it suitable for use in an Atari system even when it is the only drive in the system, as single density disks will cause the drive to operate in single density mode.

Percom supplies a Basic demo program that changes the mode of operation of the unit from double to single density, or from single to double density. Another utility supplied by Percom, BLD, is used to convert the Atari DOS 2.0S to work with double and single density drives. Percom does *not* supply a DOS with its drives, so the purchaser must get a copy of DOS 2.0S before using the system.

The DOS works the same as the unmodified Atari DOS 2.0S, however, the Percom installation manual notes that the duplicate functions (file or disk) will not work between double density and single density disks. The copy file on the DOS menus can be used to copy a file or an entire disk using the *.* wildcard as file names. The duplicate functions *will* work if the Percom disk is in single density mode *and* the disk was formatted in single density mode.

Percom has provided a utility called SDCOPY for users who have only one disk drive. SDCOPY is used to copy (duplicate) disks or files of different densities.

The following steps must be taken to create a double density DOS.

1. Place the DOS 2.0S disk into the Percom drive and boot the system.
2. Replace the DOS disk with the utility disk supplied by Percom and run the BLD utility.
3. Remove the Percom utility disk, insert a blank disk and, using the DOS menu, format this disk.
4. Select the write DOS option from the menu and write the modified DOS back to disk.

You now have a double density disk which can be used only in the Percom drive, but which will allow normal operation with the 810 if you are also using 810 drives.

Percom does not review the DOS installation procedures provided in the Atari DOS 2.0S manual, and you should ensure that the DOS is set up for the correct number of disk drives. I had several 160 errors attempting to use the Percom disk after installation until I realized that I had originally set up my DOS for single drive operation. It is a good idea to reread the Atari DOS manual if problems occur after installing the unit.

The Percom disk drive works and has performed flawlessly over the past six weeks. As a side benefit, it is faster than the Atari 810 drive so that I/O operations to the drive take a noticeably shorter time. Percom has not released any information regarding the internal operation of the drive, but at least one command has been added to the original Atari disk commands.

Percom's drive controller demonstration program shows a 78 (decimal) command which apparently causes the drive to return 12 bytes of information containing the number of tracks in the drive, the number of sectors in a track, and the number of bytes in a sector. This command does not return any useful information when sent to an 810 drive. The other disk commands (PUT SECTOR, PUT SECTOR WITH VERIFY, GET SECTOR, FORMAT DISK, and STATUS) work the same as they do with the 810.

Atari computer owners contemplating the purchase of a first or second disk drive should give serious consideration to the Percom unit. Although the $799 list price is nearly 50% higher than the list price of the 810, double density disks and the capability to control 8" drives make this a serious competitor.

The biggest problem at present is a lack of software to control these new drives and the Atari 810 drives at the same time.

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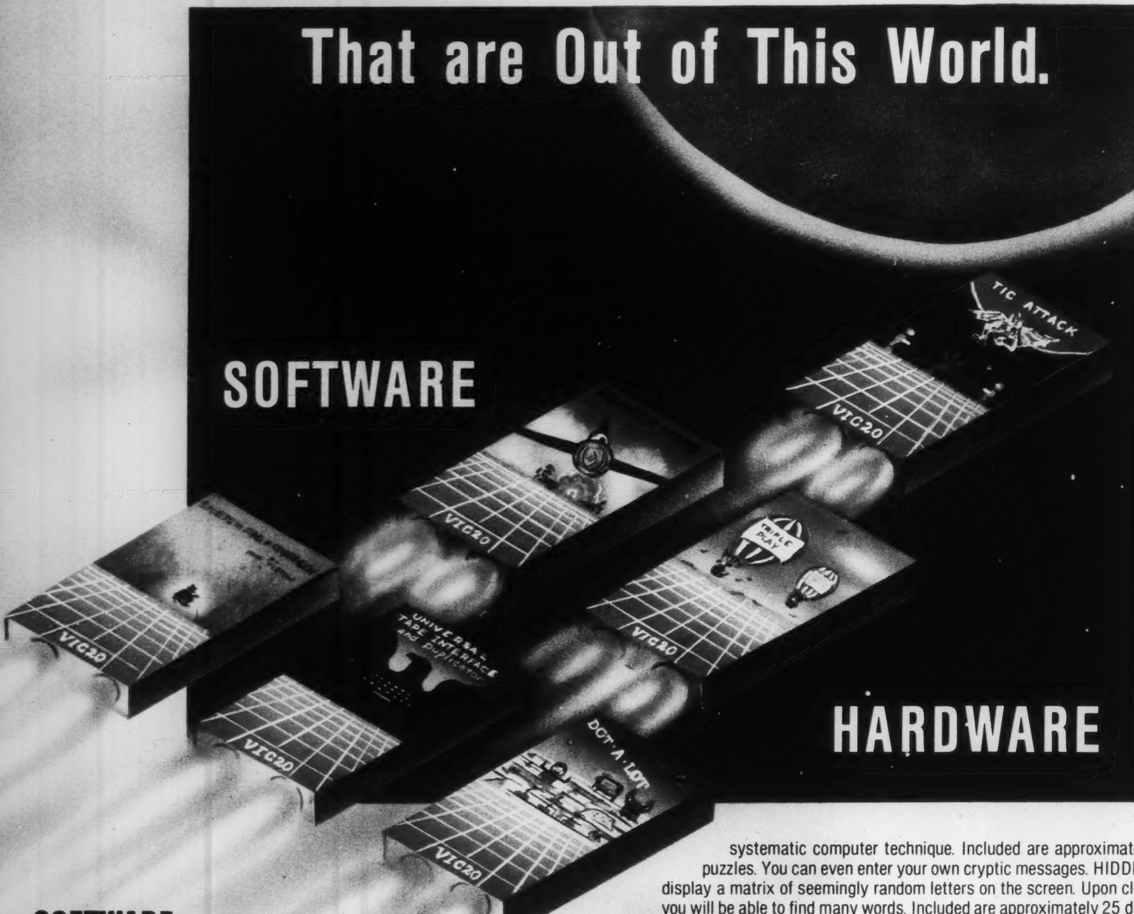
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CIRCLE 221 ON READER SERVICE CARD

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The Mannesmann Tally MT-160L

creative
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evaluation

More Print About Printers

John Anderson

As we have said on more than one occasion, the topic of microcomputer printers is quite a fast-changing one. It is extremely tough to cover the beat with continuing timeliness, and anything approaching consistency of expectations. Perhaps one answer would be to devote a monthly column to the subject. In any case, we last wrote about printers in the March issue of this year, and as that now somehow seems like about 10,000 years ago, we're due for at least a summary follow-up.

Stop the Cards and Letters, Folks

We have received a relative torrent of mail concerning that original piece, which included critical reviews of thirteen printers. Most of the mail was from owners of specific machines or from manufacturers criticizing us for being unfairly critical. We didn't mean to make anyone feel defensive about his choice in printers. None of the printers we evaluated received a rating of fewer than two stars, which indicates we felt none of them was substandard or unacceptable.

While the SCM TP-1 took a bit of a thrashing, we will admit, we did mention that the quality of the print for the price was impeccable. Okay, we were hard on printers with a great deal of plastic in their construction, reflecting perhaps a personal prejudice. If you are the owner or marketer of a machine that we criticized in one way or another, please realize that we respect your right to disagree with our conclusions. We stand by our factual statements, however, with very few exceptions.

Allow us to enumerate those few exceptions. One concerns the Anadex Silentscribe printer. We said in March that the printer was bottom-only loading, and therefore required a slotted printer stand. Anadex politely pointed out that this is not true, and we recently confirmed that continuous-form paper can be fed between the rubber feet on the bottom mounting of the unit and out the front or back side. The paper still must feed up through the narrow slot on the bottom of the printer, however, which is an awkward process to facilitate without a slotted stand. In all fairness, we should note that this very design feature helps the Anadex unit remain extremely quiet during use.

A couple of typographical errors also caused consternation. In the printer comparison table, the list price for the Qantex 7030 is incorrectly listed. The price should be $1995. And, contrary to its headline and the conventions of Strunk and White, the spelling of the product is Qantex. Apparently someone in typesetting couldn't abide the sight of a *Q* without its sidekick *U*, and so provided one.

The phone has been busy too. C. Itoh called (not Mr. Itoh personally, which was disappointing, since we have always wanted to ask him what the C stands for) to express dismay with the quality of the print sample in the output comparison chart. Upon reinspection of the sample, we had to concur—the print quality of the Prowriter is better than its faded sample attests. The reason? A dry ribbon on our test unit. As we mentioned in the glowing Prowriter review, the unit was a favorite of an ex-editor of ours, and saw quite a bit of trouble-free use. The sample we took came from the last gasps of an old ribbon.

Then there is the custom cable issue, upon which we have caught more than a bit of flak. Part of our overall printer ratings were based on ease of installation and interfacing. Obviously, if you are a user who has had the machine installed or a custom cable made by an outside source, this will not be an issue for you. Perhaps we did grow a bit cranky about custom interfacing. We just so wish that a uniform standard would emerge, so that the expense of outside installation would become in nearly all cases unnecessary.

Conversely, we were chastised for spendthriftiness by a reader who took offense at our criticism of spool ribbons, and rightly so. There we were extolling the convenience of cartridge ribbons, while failing to point out that they cost a good deal more than spool ribbons. We admit that we counted ease of ribbon replacement as a factor in printer ratings without an offset concerning their cost. Another reader brought up the possibility of reinking spools, and suffice to say we don't wish to "dirty our hands" in that issue right now. It is true that spools can be reinked more readily than cartridges.

Enough qualification. Onto the matter at hand, which happens to be a review of the finest black and white printer listing for under $1000 that we have seen to date.

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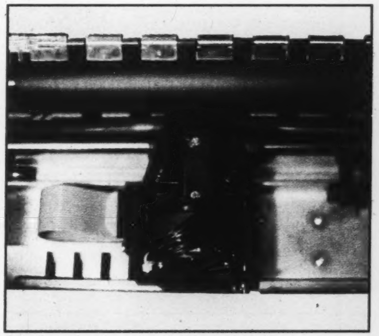
Tally-Ho

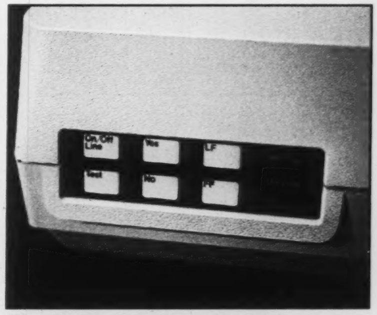
It has been quite a while since a printer has caused as much excitement around here as the Mannesmann Tally MT-160L. The unit is compact, fast, relatively quiet, capable of friction as well as tractor feed, has a truly letter quality correspondence character set, and is a snap to program and use. Like the MPI 150G keypad model that impressed us in March, the MT-160L programs directly from a control panel on the front of the printer. The MT-160L takes programmable convenience one step further, and instead of a numeric keypad, offers buttons labelled "yes" and "no" with which the user may answer questions asked by the configuration menu (see Figure 1).

Printing parameters may be set through the host computer, or from the control panel. By pressing the yes and no keys simultaneously, the MT-160L will automatically print out the configuration menu, by which all parameters may be set. By pressing the no key alone, current parameters are printed out (shown in Figure 2). There are no recessed DIP switches to set incorrectly or in which to break pencil points, and all parameters report their status in a most civilized manner.

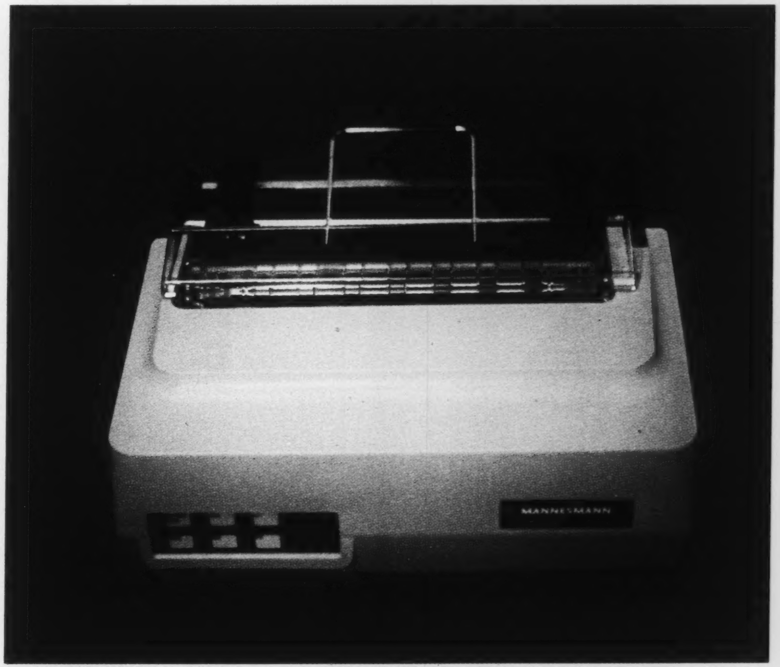
The self-reporting feature is one usually seen only in printers costing twice the price of the MT-160L. The singular lack of hard-to-reach DIP switches is unique, and a very refreshing approach, which we pray will be copied. It is now reasonable to expect an intelligent printer to configure itself to your desires—without calling on you to "hard switch" it at all.



Under the hood of the MT-160L.



The Keypad on the unit makes configuring the printer a very simple process.



The MT-160L has a totally unconventional, but pleasing external design.

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MT-160L, continued...

```
RESTORE DEFAULTS ?                YES
CHANGE FORM LENGTH ?              NO
CHANGE PRINT FORMAT ?             YES
      CHANGE LPI ?                NO
      CHANGE CPI ?                YES
           10 ?                   NO
           12 ?                   YES
      CR IMPLIES LF ?             YES
      LF AT FULL LINE ?           YES
      POPC ?                      NO
CHANGE CHAR SET ?                 NO
SLASH ZERO ?                      YES
CHANGE AUX CODE SET ?             NO
CHANGE COMM CONFIG ?              NO
END OF MENU
```

Figure 1. Configuration menu.

```
FORM LENGTH               11 INCH
LPI                       6
CPI                       CORR.QUAL.
CR IMPLIES LF             NO
LF AT FULL LINE           YES
POPC                      NO
LF IMPLIES CR             NO
CHAR SET                  USA
SLASH ZERO                NO
AUX CODE SET              NONE
INTERFACE TYPE            PARALLEL
```

Figure 2. Status report.

By pressing the "test" key, the self-test mode is initiated (See Figure 3). The mode can be cycled through pin graphics tests, and the resident character set will be used to display a sliding ASCII pattern.

Okay, so the MT-160L is one smart printer, and scores well on ease of use. What about its performance?

In a word, remarkable. Figure 4 lists the specifications of the unit, which rival, and in many cases exceed, the specs of high-end units such as the Qantex 7030, which so impressed us in March. At less than half the price *and* less than half the size, that's quite an accomplishment.

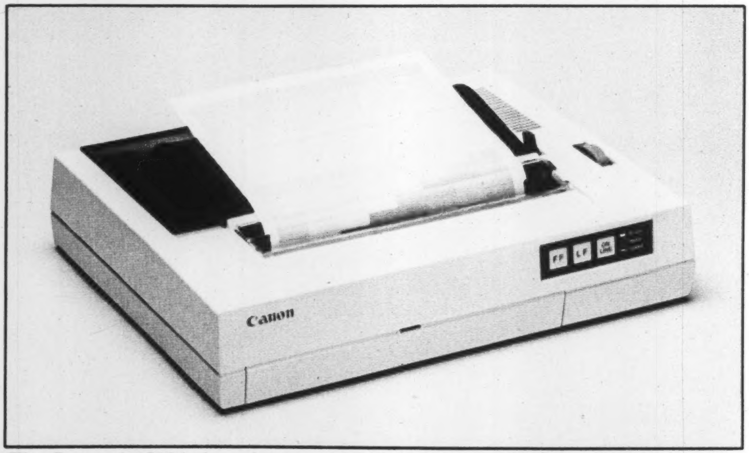
Some specifics: The MT-160L offers four pitches, over a range of 10 to 20 cpi, and in the 20 cpi mode, can squeeze 160 columns onto its maximum paper width of 10 inches. Double width capability adds another four character spacing options. The default 10 cpi character set is dark, clear and fast, at a claimed speed of up to 160 cps. Because linefeeds are fast and sure and logic-seeking bidirectionality guides the printhead, the MT-160L is among the fastest small printers you'll find.

Figure 5 gives a sample of the default font at 12 cpi. The L in the MT-160L model number stands for "letter quality." Look back at Figures 1, 2, and 3 for samples of the 40 cps dual-pass character set—the word that comes to mind is *superb*. Though it is much slower than the default, the letter quality font is still a good deal faster than a daisy wheel, and in our opinion, of comparable quality. It is really hard to believe that its print was created by a dot-matrix machine. Tally-ho, indeed.

A Fusillade from Canon

Upon first glance, it seems quite ordinary; just another compact dox matrix printer for the under $800 market. Then it comes time for a classic double take, and for some, a hard swallow. Linefeeding very quietly from the top of the unit, you see, is a page printed in vibrant color—make that seven vibrant colors. So don't be misled by the quiet. That low hissing rhythm is very dramatic. At less than 50 dB, it is the roar of Canon entering the microcomputer printer race with a walloping bang.

The Canon A-1210 color printer is



The Canon A-1210 color printer: seven colors for under $800, in ink-jet dot matrix. And it takes up no more space than an MX-80.

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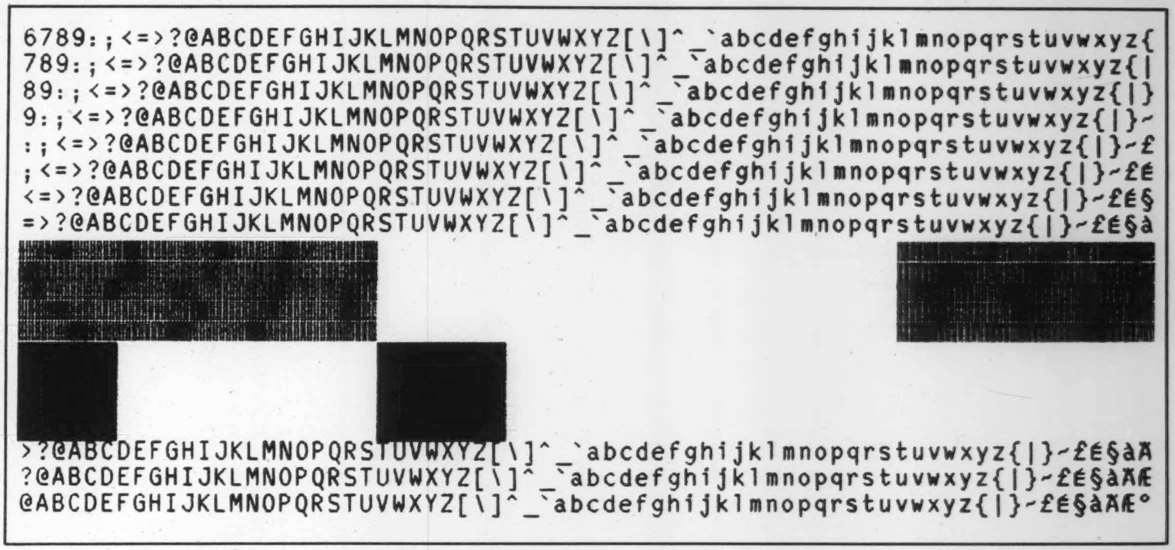

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6789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{
789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|
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```

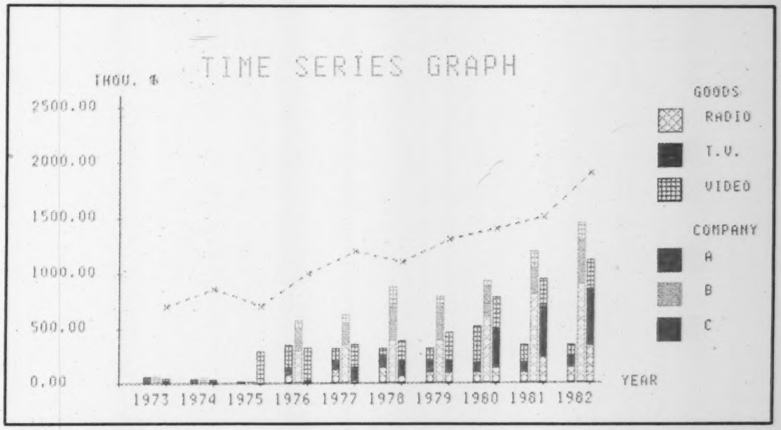
Figure 3. Cycling through a self-test. Reproduced at actual size.

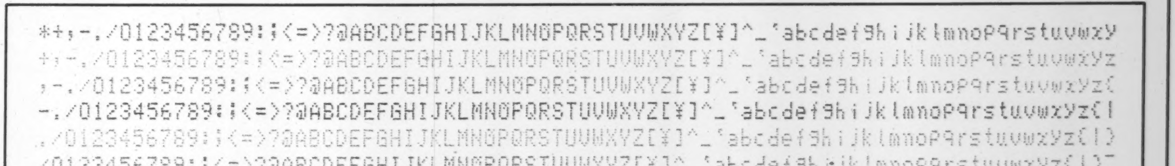
Both serial and parallel interfacing is possible, using the most popular (and most nearly standard) connector cables. These are the 25-pin male DB-25 for serial connection, and 36-pin male Centronics style for parallel connection. The two female connectors sit side by side on the rear panel of the printer, and make installation of the unit as painless as possible.

As the Mannesmann Tally MT-160L is of European origin, allowance has been made for seven foreign character sets and easy selection of them. And though it may be a stereotyped cultural generalization, the term "German precision" came to mind more than once. The unit is superbly engineered and very reliable. In two months of heavy use, the only problem we had was a bit of printhead lockup, which was caused by a dustball on a drive axle. The end of the dustball signi-

capable of printing said seven vibrant colors on plain paper, using what it calls "drop-on-demand" *ink-jet* technology. It can print standard and enlarged characters and hi-res graphics of up to 640 dots per line, at a claimed speed of up to 40 cps. The most impressive statistic we can quote, however, is the suggested price of the unit, now set at $795 *list*. Could this be the next product to set the printer industry on its ear? The early returns are impressive—we've seen a unit and it does work—beautifully. And in such exquisite quietude.

Watch for an in-depth review of the Canon A-1210 in an upcoming issue. For more information contact Canon USA, One Canon Plaza, Lake Success, NY 11042. (516) 488-6700.





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*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_'abcdefghijklmnopqrstuvwxy
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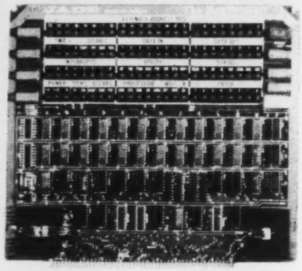
OKIDATA 2410	*15" 350 CPS*	**CALL**
DAISYWRITER 2000	*48K Daisywheel*	**$1395.00**
GEMINI 10	*100 CPS with Graphics*	**$349.95**
GEMINI 15	*15" with Graphics*	**$499.95**

DISK TUBS

Diskette Storage Boxes

Clear Plexiglas storage boxes for up to 75 Diskettes

MMA-505	*Holds 75 5¼" Diskettes*	**$19.95**
MMA-508	*Holds 50 8" Diskettes*	**$24.95**



S-100 I/O BOARDS

THE BUS PROBE - Jade

Inexpensive S-100 Diagnostic Analyzer

TSX-200B	*Bare board*	**$59.95**
TSX-200K	*Kit*	**129.95**
TSX-200A	*A & T*	**$159.95**

I/O-4 - SSM Microcomputer

2 serial I/O ports plus 2 parallel I/O ports.

IOI-1010B	*Bare board w/manual*	**$35.95**
IOI-1010K	*Kit with Manual*	**$179.95**
IOI-1010A	*A & T*	**$249.95**

I/O-5 - SSM Microcomputer

Two serial & 3 parallel ports, 110-19.2K Baud

IOI-1015A	*A & T*	**$289.95**

INTERFACER 4 - CompuPro

3 serial, 1 parallel, 1 Centronics parallel.

IOI-1840A	*A & T*	**$314.95**
IOI-1830C	*CSC*	**$414.95**

S-100 EPROM BOARDS

PB-1 - SSM Microcomputer

2708, 2716 EPROM board with on-board programmer.

MEM-99510K	*Kit with manual*	**$154.95**
MEM-99510A	*A & T with manual*	**$219.95**

PROM-100 - SD Systems

2708, 2716, 2732 EPROM programmer with softrware.

MEM-99520K	*Kit with software*	**$189.95**
MEM-99520A	*A & T with software*	**$249.95**

NEW! CP/M PLUS 3.0

CP/M 3.0 is Digital Research's latest version of the industry standard disk operating system. It features many performance improvements, such as intelligent record buffering, improved directory handling, "HELP" facility, time date stamping of files and many more improvements. AND A TREMENDOUS INCREASE IN SPEED!!! it is fully CP/M 2.2 compatible and requires no changes to your existing application software. Available only to Versafloppy II owners with SBC-200 CPU's

SFC-55009059F	*Unbanked, RS232*	**$250.00**
SFC-55009058F	*Unbanked, VDB8024*	**$250.00**
SFC-55009057F	*Banked, RS232*	**$250.00**
SFC-55009056F	*Banked, VDB8024*	**$250.00**
SFC-55009057D	*Manual*	**$50.00**

DUAL DISK SUB-SYSTEMS

Disk Sub-Systems - Jade

Handsome metal cabinet with proportionally balanced air flow system, rugged dual drive power supply, power cable kit, power switch, line cord, fuse holder, cooling fan, never-mar rubbr feet, all necessary hardware te mount 2-8" disk drives, power supply, and fan, does not include signal cable.

Dual 8" Sub-Assembly Cabinet

END-000420	*Bare cabinet*	**$49.95**
END-000421	*Cabinet kit*	**$199.95**
END-000431	*A & T*	**$249.95**

8" Sub-Systems - Single Sided, Double Density

END-000423	*Kit w/2 Siemens FD100-8Ds*	**$650.00**
END-000424	*A & T w/2 Siemens FD100-8Ds*	**$695.00**
END-000433	*Kit w/2 Shugart SA-801Rs*	**$999.95**
END-000434	*A & T w/2 Shugart SA-801Rs*	**$1195.00**

8" Sub-Systems - Double-Sided Double-Density

END-000426	*Kit w/2 Qume DT-8s*	**$1224.95**
END-000427	*A & T w/2 Qume D-8s*	**$1424.95**
END-000436	*Kit w/2 Shugart SA-851Rs*	**$1274.95**
END-000437	*A & T w/2 Shugart SA-851Rs*	**$1474.95**

8" SLIMLINE SUB-SYSTEMS

Dual Slimline Sub-systems - Jade

Handsome vertical cabinet with scratch resistant baked enamel finish, proportionally balanced air flow system, quiet cooling fan, rugged dual drive power supply, power cables, power switch, line cord, fuse holder, cooling fan, all necessary hardware to mount 2-8" slimline disk drives, does not include signal cable.

Dual 8" Slimline Cabinet

END-000820	*Bare cabinet*	**$59.95**
END-000822	*A & T w/o drives*	**$179.95**

Dual 8" Slimline Sub-Systems

END-000823	*Kit w/2 SS DD*	**$919.95**
END-000824	*A & T w/2 SS DD*	**$949.95**
END-000833	*Kit w/2 DS DD*	**$1149.95**
END-000834	*A & T w/2 DS DD*	**$1179.95**

S-100 CPU BOARDS

SBC-200 - SD Systems

4 MHz Z-80A CPU with serial & parallel I/O, 1K RAM, 8K ROM space, monitor PROM included.

CPC-30200A	*A & T*	**$329.95**

THE BIG Z - Jade

2 or 4 MHz switachable Z-80 CPU board with serial I/O, accommodates 2708, 2716, or 2732 EPROM, baud rates from 75 to 9600.

CPU 30201B	*Bare board w/manual*	**$35.00**
CPU-30201K	*Kit with Manual*	**$149.95**
CPU-30201A	*A & T with Manual*	**$199.95**

2810 Z-80 CPU - C.C.S.

2 or 4 MHz Z-80 CPU with serial IO port & on board monitor PROM, front panel compatible.

CPU-30400A	*A & T with PROM*	**$289.95**

CPU-Z CompuPro

2 or 4 MHz Z80A CPU, 24 bit addressing.

CPU-30500A	*2/4 MHz A & T*	**$279.95**
CPU-30500C	*3/6 MHz CSC*	**$374.95**

8085/8088 - CompuPro

Both 8 & 16 bit CPUs, standard 8 bit S-100 bus, up to 8 MHz, accesses 16 Megabytes of memory.

CPU-20510A	*6 MHz A & T*	**$398.95**
CPU-20510C	*6/8 MHz CSC*	**$497.95**

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5 1/4 DISK DRIVES

Tandon TM100-1 *single-sided double-density 48 TPI*

MSM-551001	$219.95 ea	2 for **$199.95 ea**

Shugart SA400L *single-sided double-density 40 track*

MSM-104000	$234.95 ea	2 for **$224.95 ea**

Tandon TM100-2 *double-sided double-density 48 TPI*

MSM-551002	$294.95 ea	2 for **$269.95 ea**

TEAC FD55A *single-sided double-density 40 track*

MSM-660551	*$299.95 ea*	*2 for* **$239.95**

5¼" Cabinets with Power Supply

END-000216	*Single cab w/power supply*	**$69.95**
END-000226	*Dual cab w/power supply*	**$94.95**

S-100 MOTHERBOARDS

ISO-BUS - Jade

Silent, simple and on sale - a better motherboard.

6 Slot (5¼" x 8⅝")

MBS-061B	*Bare board*	**$22.95**
MBS-061K	*Kit*	**$39.95**
MBS-061A	*A & T*	**$69.95**

12 Slot (9¾" x 8⅝")

MBS-121B	*Bare board*	**$34.95**
MBS-121K	*Kit*	**$69.95**
MBS-121A	*A & T*	**$109.95**

18 Slot (14½" x 8⅝")

MBS-181B	*Bare board*	**$54.95**
MBS-181K	*Kit*	**$99.95**
MBS-181A	*A & T*	**$149.95**

8" DISK DRIVES

Siemens FDD 100-8 Single-sided double-density

MSF-201120	**$274.95 ea**	**2 for $249.95 ea**

Shugart SA801R Single-sided double-density

MSF-10801R	**$394.95 ea**	**2 for $389.95 ea**

Shugart SA851R Double-sided double-density

MSF-10851R	**$554.95 ea**	**2 for $529.95 ea**

Qume DT-8 Double-sided double-density

MSF-750080	**$554.95 ea**	**2 for $529.95**

Tandon TM848-1 Single-sided double-den thin-line

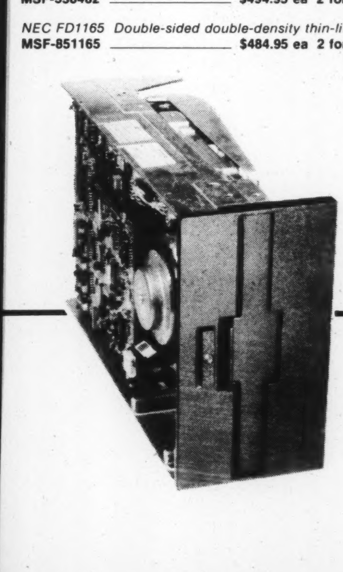
MSF-558481	**$379.95 ea**	**2 for $369.95 ea**

Tandon TM848-2 Double-sided double-den thin-line

MSF-558482	**$494.95 ea**	**2 for $484.95**

NEC FD1165 Double-sided double-density thin-line

MSF-851165	**$484.95 ea**	**2 for $449.95**



MODEMS

SMART BUY In MODEMS - Signalman

1200 and/or 300 baud, direct connect, automatic answer or originate selection, auto-answer/auto-dial on deluxe models. 9v battery allows total portability, full one year warranty.

IOM-5600A	*300 baud direct connect*	**$89.95**
IOM-5610A	*300 baud Deluxe*	**$149.95**
IOM-5620A	*1200/300 baud Deluxe*	**$369.95**
IOM-5650A	*300 baud for Osborne*	**$119.95**
IOM-5630A	*300 baud card for IBM*	**$269.95**

SMARTMODEM - Hayes

Sophisticated direct-connect auto-answer/auto-dial modem, touch-tone or pulse dialing. RS-232C interface, programmable.

IOM-5500A	*Smartmodem 1200*	**$574.95**
IOM-5400A	*Smartmodem 300*	**$224.95**
IOK-1500A	*Hayes Chronograph*	**$218.95**
IOM-1100A	*Micromodem 100*	**$368.95**
IOM-2010A	*Micromodem II w/term prgm*	**$329.95**
IOM-2012A	*Terminal program for MMII*	**$89.95**

1200 BAUD SMART CAT - Novation

103/212 Smart Cat & 103 Smart Cat, 1200 & 300 baud, built-in dialer, auto re-dial if busy, auto answer/disconnect, direct connect, LED readout displays mode, analog/digital loop-back self tests, usable with multi-line phones.

IOM-5241A	*300 baud 103 Smart Cat*	**$229.95**
IOM-5251A	*1200 baud 212/103 Smart Cat*	**$549.95**

J-CAT™ MODEM - Novation

1/5 the size of ordinary modems, Bell 103, manual or auto-answer, automatic answer/orginate, direct connect, built-in self-test, two LEDs and audio beeps provide status information.

IOM-5261A	*Novation*	**$149.95**

S-100 DISK CONTROLLERS

VERSAFLOPPY II - SD Systems

Double density disk controller for any combination of 5¼" and 8" single or double sided, analog phase-locked loop data seperator, vectored interrupts. CP/M 2.2 & Oasis compatible, control/diagnostic software PROM included.

IOD-1160A	*A & T with PROM*	**$359.95**
SFC-55009047F	*CP/M 3.0 with VF-II*	**$139.95**

DOUBLE D - Jade

High reliability double density disk controller with on-board Z-80A, auxiliary printer port, IEEE S-100 can function in multi-user interrupt driven bus.

IOD-1200B	*Bare board & hdwr man*	**$59.95**
IOD-1200K	*Kit w/hdwr & sftwr man*	**$299.95**
IOD-1200A	*A & T w/hdwr & sftwr man*	**$325.95**
SFC-59002001F	*CP/M 2.2 with Double D*	**$99.95**

EPROM ERASERS

ULTRA-VIOLET EPROM ERASERS

inexpensive erasers for industry or home.

XME-3100A	*Spectronics w/o timer*	**$69.50**
XME-3101A	*Spectronics with timer*	**$94.95**
XME-3200A	*Logical Devices*	**$49.95**

SINGLE BOARD COMPUTER

SUPERQUAD - Adv. Micro Digital

Single board, standard size S-100 computer system, 4MHz Z-80A single or double density disk controller for 5¼" or 8" drives, 64K RAM, extended addressing up to 4K of EPROM. 2 serial & 2 parallel I/O ports, real time interrupt clock, CP/M compatible.

CPC-30800A	*A & T*	**$724.95**
IOX4232A	*Serial I/O adapter*	**$29.95**

VIDEO MONITORS

Video Monitor - Jade

1000 lines, ultra-high resolution, 20 MHz ultra-high band width 9" or 12", Amber or Green phosphor, the finest monitors we sell.

VDM-750920	*9" Green*	**$99.95**
VDM-750910	*9" Amber*	**$129.95**
VDM-751220	*12" Green*	**$129.95**
VDM-751210	*12" Amber*	**$139.95**

APPLE II ACCESSORIES

DISK DRIVE For APPLE™

Totally Apple compatible, 143,360 bytes per drive on DOS 3.3 full one year factory warranty, half-track capability reads all Apple software, plugs right into Apple controller as second drive, DOS 3.3, 3.2.1, Pascal, & CP/M compatible.

MSM-12300	*Add-on Apple Drive*	**$249.95**
MSM-123100	*Controller*	**$69.95**

16K RAM CARD - For APPLE II

Expand your Apple II to 64K, use as language card, full 1 year warranty. Why spend $175.00?

MEX-16700A	*Save over $115.00*	**$49.95**

Z-CARD For APPLE II - A.L.S.

Two computers in one, Z-80 & 6502, more than doubles the power and potential of your Apple, includes Z-80 CPU card CP/M 2.2 and complete manual set. Pascal compatible, utilities are menu-driven. One year warranty.

CPX-62800A	*A & T with CP/M 2.2*	**$159.95**

SMARTERM II - A.L.S.

80 column x 24 line video card for Apple II, addressable 25th status line, normal/inverse or high/low video, 128 ASCII characters, upper and lower case, 7 x 9 dot matrix with true decenders, standard Data Media terminal control codes, CP/M Pascal & Fortran compatible, 50/60 Hz, 40/80 column selection from keyboard.

IOV-2500A	*ALS Smarterm II*	**$169.95**

SERIAL I/O CARD - A.L.S.

Full feature serial card for modems & printers, baud rates from 110 to 19,200, CTC/RTS & X-on/X-off protocols, auto line feed. RS-232C cable interface included.

IOI-1000A	*A & T "Dispatcher Card"*	**$129.95**

CP/M 3.0 CARD For APPLE - A.L.S.

The most powerful card available for your Apple!

6 MHz, Z-80B, additional 64K of RAM, CP/M 3.0 Plus 100% CP/M 2.2 compatibility, C Basic, CP/M graphics, 300% faster than any other CP/M for Apple. One year warranty.

CPX-62810A	*A.L.S. CP/M Card*	**$369.95**

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VINYL STORAGE PAGES 5¼" or 8" 10/$5

SNAP-IT POWER CENTER Turn one outlet into six
- Shock-safe
- Unbreakable
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- Lighted On-Off Switch $19.95

DISK DRIVE HEAD CLEANING KITS Prevent head crashes and ensure error-free operation 5¼" or 8" $19.50

HARDHOLE DISK PROTECTORS Reinforcing rings of tough mylar protect disk hole edge from damage.

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Applicators	$3	$4
Hardhole Rings (50)	$6	$8

SFD C- 10 CASSETTES . . 10/$7 (All cassettes include box and labels.) Get 8 cassettes, C-10 Sonic, and Cassette/8 Library-Album, as illustrated, for only $8

LIBRARY CASES
8" Kas-sette/10 $2.99
5¼" Mini Kas-sette/10 $2.49

We also stock at FANTASTIC low prices MAXELL 3M DYSAN WABASH OPUS Floppies, Tape, Data Cartridges, Data Cassettes, and Disk Packs

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CIRCLE 103 ON READER SERVICE CARD

MT-160L, continued...

Type: dot matrix

Number of Columns:
80 @ 10 cpi
96 @ 12 cpi
132 @ 16.7 cpi
160 @ 20 cpi

Print Speed:
MT160I: DP mode - 160 cps @ 10 cpi
Graphics - equivalent to 160 cps @ standard density
- equivalent to 80 cps @ double density
- 40% duty cycle maximum*

MT160L: DP mode - 160 cps @ 10 cpi
Graphics - equivalent to 160 cps @ standard density
- equivalent to 80 cps @ double density
- equivalent to 40 cps @ double density and high
- 40% duty cycle maximum*

*The graphics duty cycle specification limits the firing of any hammer to an average of 40 per cent of its maximum allowable positions over the area of a page (11 inches).

Copies:
Optional Roll Paper Holder: Original plus two copies.
Optional Tractor Feed: Original plus three copies.

Paper Width:
10 Inch Width Maximum

Character Spacing:
Standard width characters
10, 12, 16.7, 20 characters per inch
Double width characters
5, 6, 8.3, 10 characters per inch

Character Set:
MT160I - 96 US ASCII plus 32 international characters.
MT160L - 96 US ASCII plus 32 international characters.
Modified sans serif standard font style in correspondence quality print.

AC Power Requirements:
Voltage
Universal switchable power supply
100, 120, 220, 240, 10%
50/60 Hz 2 Hz

Input Power:
120W maximum operating
40W maximum standby

Weight:
18 pounds

Price: $995

Figure 4. Technical Specifications.

Introducing

GENIE™ 5+5

5.25″ Removable GENIE Winchester Cartridge Drive

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The Genie Cartridge Drive is a revolutionary new 10 Megabyte Hard Disk Drive that includes a 5 Megabyte removable Winchester catridge. The cartridge Drive system simply plugs into your computer, and includes all necessary software and hardware. Genie Drives are compatible with most popular software, and each cartridge replaces over 30 double-density floppy disks.

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FEATURES

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- Power-on self-test.
- Easy back-ups in minutes.
- System expandable to eight drives.
- Built-in error detection and correction.
- No preventative maintenance required.
- Comes complete with all necessary software and hardware.
- MTBF 8000 Hours.
- Built-in fan.
- Operates 110/220 VAC 50-60 Hz.
- One year limited warranty.

Only **$3995.00***

Removable Cartridge. Imagine, 5 Megabytes in the palm of your hand. These small **Winchester cartridges** are only .75 inches thick and 5.50 inches square. The disk itself is completely sealed from the outside and all its hazards by a sliding door that opens only once the cartridge is firmly seated inside the drive. Long term availability of this cartridge is assured by its adoption by several well known manufacturers including **Dysan** and **Memorex,** the world leaders in computer mass storage media.

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Comprehensive system utilities package.
Allows eight-character names to be assigned to virtual volumes.
User Can back-up to any Genie REMOVABLE Cartridge Drive, or to diskettes. Mix & Match different system file types on the same disk.
System status screen messages. Up to 16 volumes on-line at a time.

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CIRCLE 182 ON READER SERVICE CARD

SCREENWRITER II THE NO. 1 WORD PROCESSOR

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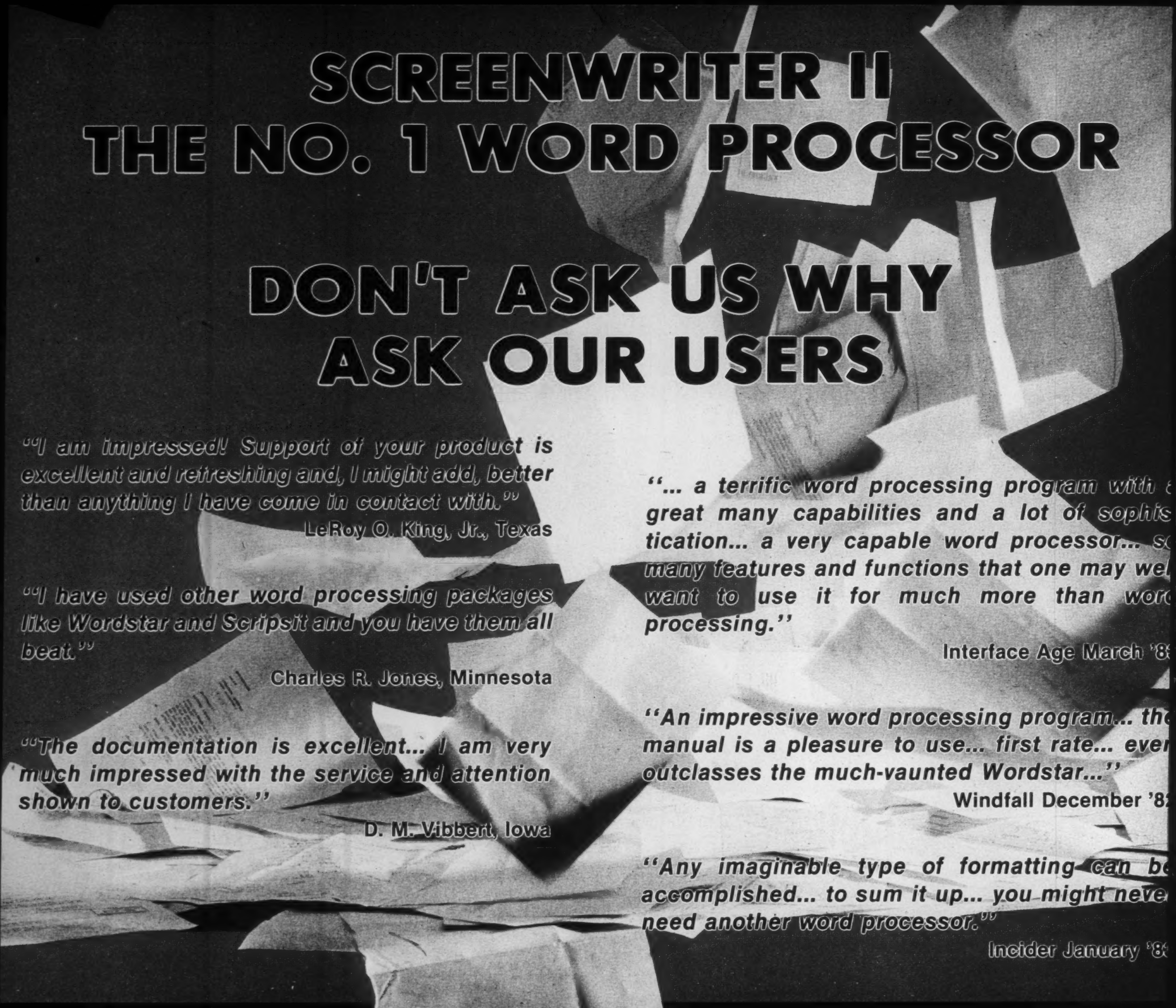

"I am impressed! Support of your product is excellent and refreshing and, I might add, better than anything I have come in contact with."
LeRoy O. King, Jr., Texas

"I have used other word processing packages like Wordstar and Scripsit and you have them all beat."
Charles R. Jones, Minnesota

"The documentation is excellent... I am very much impressed with the service and attention shown to customers."
D. M. Vibbert, Iowa

"... a terrific word processing program with great many capabilities and a lot of sophis tication... a very capable word processor... s many features and functions that one may wel want to use it for much more than wor processing."
Interface Age March '8

"An impressive word processing program... th manual is a pleasure to use... first rate... eve outclasses the much-vaunted Wordstar..."
Windfall December '8

"Any imaginable type of formatting can b accomplished... to sum it up... you might neve need another word processor."
Incider January '8

We can tell you that Screenwriter II is the best-selling word processor for the Apple computer,* but only our customers can tell you it's the best. We pack it with all of the features you demand from a word-processor. Then we back it up with the finest product support in the industry. That's why people who use Screenwriter II everyday bandy about words like "unbelievable," "impressive," "excellent" and "the best." They said it; we believe it. So will you.

Screenwriter II is available for the Apple II/II+ and Apple IIe.

For more information please contact Sierra On-Line at (209) 683-6858 or write. Sierra On-Line Building, Coarsegold, CA 93614.

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SCREENWRITER PROFESSIONAL — Screenwriter II packaged with the best-selling spelling verification system. The Dictionary — The professional combination

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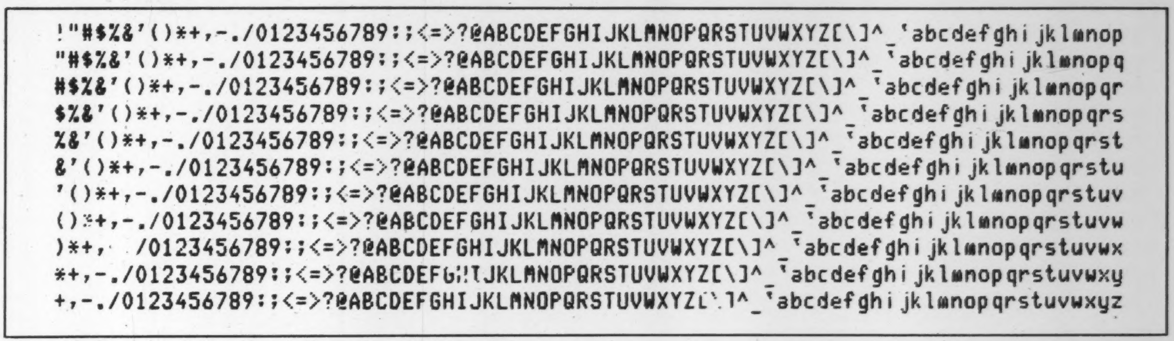
*As reported in Softalk magazine.

CIRCLE 263 ON READER SERVICE CARD



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+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
```

Figure 5. Draft quality at 12 cpi. Reproduced at actual size.

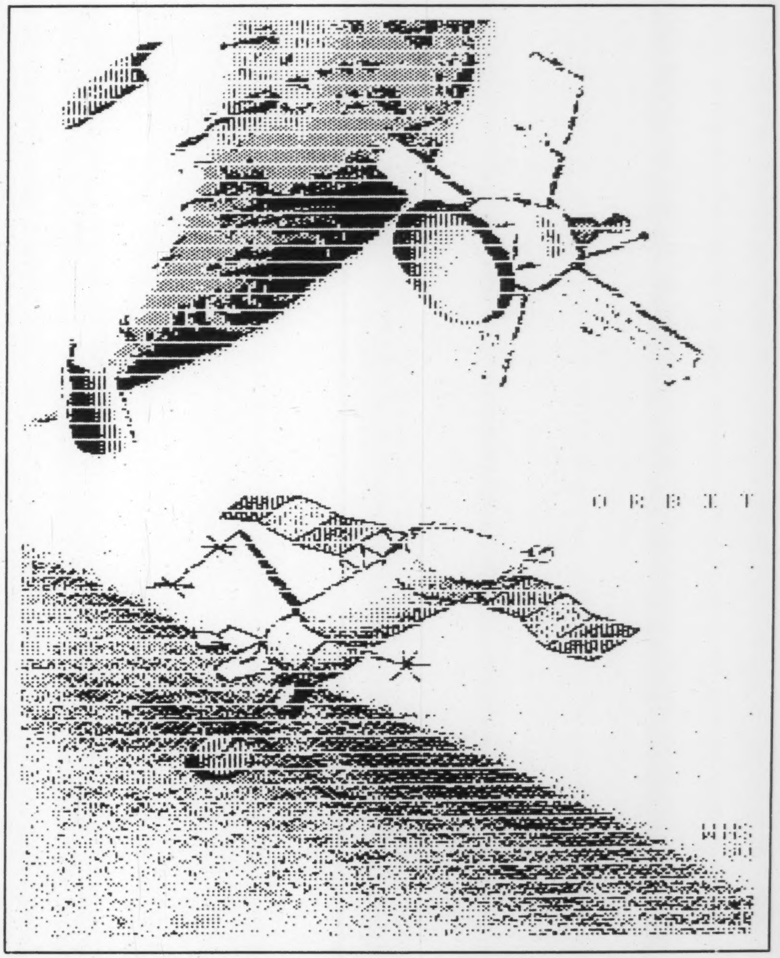

Figure 6. Serviceable graphics capability.

fied the end of the problem. So much for maintenance.

The Buzz of the Fly in the Ointment

Our sole complaint about the unit is a nitpicky one, but it is well known that really nitpicky things drive folks like us up the wall. The stepper motor on the MT-160L idles noisily, and it does so even when the unit is off-line. Hence, users will quickly learn that the MT-160L is not a machine to be left on when not printing. That is a shame, since it practically abrogates the need for the on-line switch.

It is hard to describe the sound of the off-line Mannesmann Tally machine, which is not loud at all, merely very grating. The closest description we can give is something along the lines of a noisy refrigerator, heard through an empty beer can. It gets to you.

During actual printing, the unit is of about average noisiness; we measured it at 64 dB. The reading was made from one meter in front of the printer, while it rested on a foam printer mat, printing in correspondence mode. The noise was quite tolerable.

The operator's manual is clearly laid out, profusely illustrated, and refreshingly free of typographical errors. Although it is unindexed, its table of contents is quite thorough and should suffice in most cases. In it you'll find pin-outs for cabling and tables documenting all escape codes. If, as we suspect, the manual was translated from German, a splendid job was done.

As for the graphics capability of the machine, Figure 6 is worth a thousand words. The printer can output at 50 or 100 DPI (dots per inch), and a minimum line feed increment of 1/8 inch produces smooth, bold graphics in the same manner as it produces dual-pass letter quality print. The documentation points out that the printhead duty cycle limits the firing of any hammer to an average of 40 per cent of its maximum allowable positions over the area of a page (11 inches). We doubt that this structure will interfere with many graphics applications, save those of users who wish to produce runs of totally black paper.

The Mannesmann Tally MT-160L is a fine machine, and if you are in the market for a new printer now, you owe it to yourself to get a look at it. Although we enjoy reviewing products that we are enthusiastic about, we rarely write a review that can be paraphrased in the simple words "loved it." This review is an exception. The MT-160L printer is another stride in quality and features in the under $1000 market. If only it printed in color, too! □

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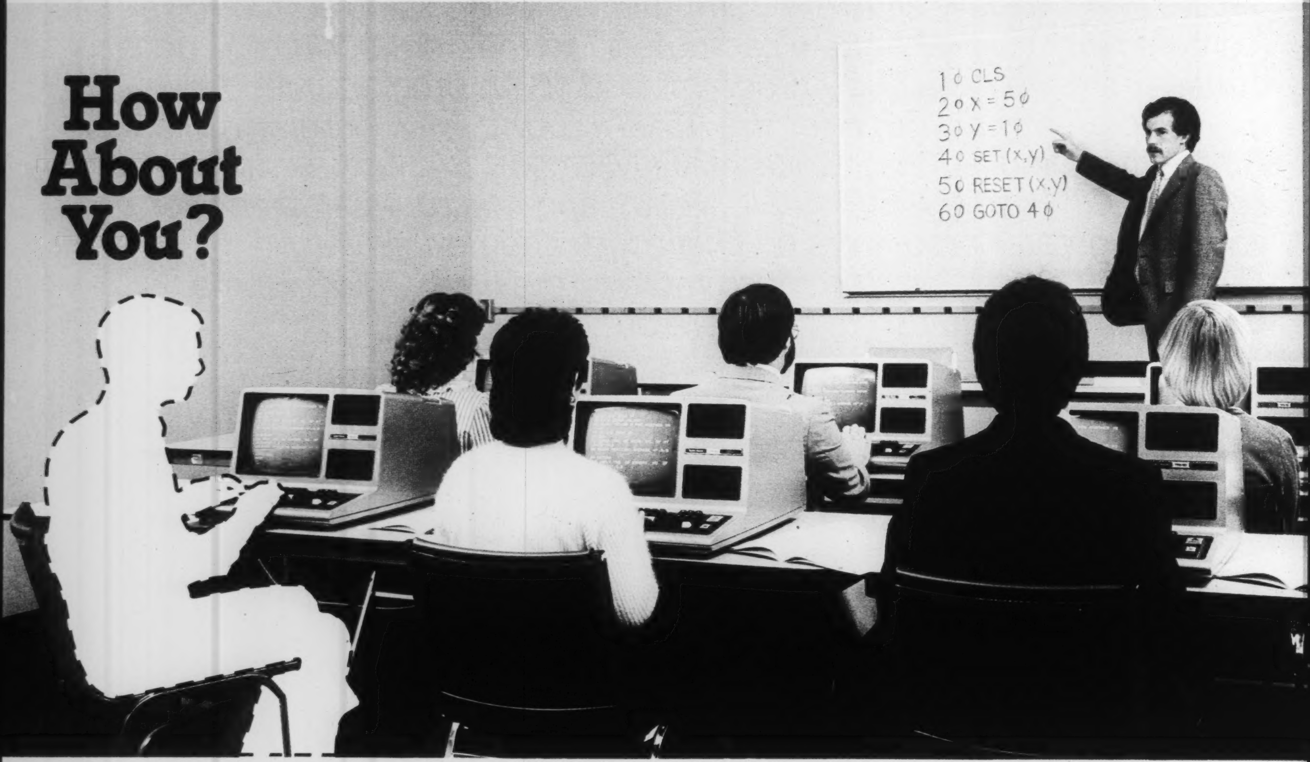
How About You?

```
10 CLS
20 X=50
30 Y=10
40 SET (X,Y)
50 RESET (X,Y)
60 GOTO 40
```

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Praxis Makes Perfect

Olivetti Praxis Typewriter Conversions: Are They Worth It?

Gordon McComb

Printers can be so dull. I dreaded the thought of having to buy a daisywheel machine, but the chore had become inevitable. Midway through my search, I entered a neighborhood computer store, and gazed down one of the carpeted isles.

Printers.

The models sat listlessly, perched atop an imitation wood counter—in an unending line—clones of clones of clones. I had looked at so many that after a time, their images began to blur into one congealed, sticky mess. They all seemed to work the same, look the same, cost the same. That is, all except one—one that I had never seen before. In reality, it wasn't hard to single this new one out from the crowd.

A lamp shone above the printer—the unique one—and cast a warm glow over its classic black exterior. I read the writing emblazoned on its sleek body—Olivetti Praxis 30. "But that's a typewriter," I said to the salesperson. "It's also a printer," she gaily replied. She smiled, reached behind the printer, and turned it on.

"So it is," I mused, tracing a thick pale blue cable that emerged from the base of the printer. The cable was attached to a small plastic box that rested innocently beside an Osborne portable. Another cable twisted and looped between the RS-232 port of the computer and the box.

I threaded a sheet of letterhead into the printer and rolled the platen until the tip of the paper peeked past the printhead. I told the computer to print and glanced over at the Olivetti.

The daisywheel printhead slid effortlessly to the left margin. The platen advanced a few lines with a strange "shick shick" sound, and the printing began.

It wasn't the speed with which the let-

The Olive-80 and Olivetti Praxis 35 typewriter cum printer: it can be used as both any time.

Gordon McComb, 1225 Palomar Pl., Suite 100, Vista, CA 92083.

ters were printed that impressed me. In fact, the Olivetti typewriter/printer has a top speed of only 12 characters per second. Rather, it was the superb type quality that caught my eye, and the fact that for less than $800, I could get not only an interchangeable daisywheel letter quality printer, but a full featured electronic typewriter as well. Double duty for half the price! It wasn't hard for me to decide which printer I was going to buy.

But as I was signing my check, I overhead another customer ask how different this Olivetti typewriter/printer was from the other Praxis-based model that was out. "What other model!?" I shouted as I stashed the check back in my coat pocket. "You mean there's another one?"

> **"What other model!?" I shouted as I stashed the check back in my coat pocket.**

Table 1. Olive-80 Character Set.

KEYBOARD I						KEYBOARD II					
32		64	@	96	'	32		64	£	96	'
33	!	65	A	97	a	33	!	65	A	97	a
34	"	66	B	98	b	34	`	66	B	98	b
35	#	67	C	99	c	35	¨	67	C	99	c
36	$	68	D	100	d	36	$	68	D	100	d
37	%	69	E	101	e	37	[	69	E	101	e
38	&	70	F	102	f	38	^	70	F	102	f
39	'	71	G	103	g	39	'	71	G	103	g
40	(	72	H	104	h	40	(	72	H	104	h
41	)	73	I	105	i	41	)	73	I	105	i
42	*	74	J	106	j	42	ç	74	J	106	j
43	+	75	K	107	k	43		75	K	107	k
44	,	76	L	108	l	44	,	76	L	108	l
45	–	77	M	109	m	45	–	77	M	109	m
46	.	78	N	110	n	46	.	78	N	110	n
47	/	79	O	111	o	47	|	79	O	111	o
48	0	80	P	112	p	48	0	80	P	112	p
49	1	81	Q	113	q	49	1	81	Q	113	q
50	2	82	R	114	r	50	2	82	R	114	r
51	3	83	S	115	s	51	3	83	S	115	s
52	4	84	T	116	t	52	4	84	T	116	t
53	5	85	U	117	u	53	5	85	U	117	u
54	6	86	V	118	v	54	6	86	V	118	v
55	7	87	W	119	w	55	7	87	W	119	w
56	8	88	X	120	x	56	8	88	X	120	x
57	9	89	Y	121	y	57	9	89	Y	121	y
58	:	90	Z	122	z	58	:	90	Z	122	z
59	;	91	,	123	(	59	¿	91	¡	123	(
60	¼	92	½	124	/	60	Ñ	92	ñ	124	|
61	=	93	¢	125	)	61	é	93	]	125	)
62	)	94	.	126	–	62	)	94	¿	126	–
63	?	95	_	127		63	?	95	_	127	

Yes. What I found out was this: Several companies offer converted Olivetti Praxis 30 printers, and at first glance, it would seem that since they all use the same basic typewriter, they too, would be the same. Look again. The two most popular Praxis conversions—the Bytewriter and the Olive-80—are far from being similar. Here's what I found out about both machines.

What's a Praxis?

A description of the Olive (which is available in both typewriter/printer and typewriter conversion kit models) and the Bytewriter wouldn't be complete without first telling you about the Olivetti Praxis 30, the machine upon which both printers are based.

The Praxis is a fully portable typewriter—it even comes with its own rigid plastic carrying case. The real key to the Praxis is that it is electronic; that is, there are no linkages or solenoids or bellcranks activated when you depress one of the keys as there are with an IBM Selectric or standard electric typewriter. The Praxis keyboard is engineered like a computer keyboard; it is just a series of switches.

When one of the keys is depressed, an encoder circuit inside the typewriter notes which key has been struck, and directs the motor driven printhead to type the proper character. A second motor is used on the typewriter to position the printhead along the length of the platen.

The Praxis uses daisywheel elements, so you can switch from one typestyle to another. The wheels aren't compatible with any other printer or typewriter, so you have to buy them specially for the machine. The resin-tipped plastic wheels retail for $29.95, but there are more than a dozen different styles available (resin-tipped wheels are supposed to last longer than plain plastic ones). The Praxis uses cartridge loaded fabric and film ribbons.

The Praxis has its own 12-character keyboard buffer, and it is extremely difficult to out-run it. You cannot jam keys. It also remembers the last ten characters typed. So if you make a mistake, you can go back to the letter (as long as it is less than ten characters from where you left off), hit the "correct" key, and the character will be automatically lifted off by the correcting ribbon built into the machine.

Although the Praxis doesn't print all 96 characters normally found on a standard daisywheel printer, it is capable of producing some special purpose characters such as ˆ, Ñ, £, and ó. Separate keys don't exist for these characters; a switch on the typewriter labelled KB I/KB II allows you to toggle between two keyboards, and print the special characters.

Even though the Praxis typewriter doesn't allow you to alter the printing pitch (from 12 characters per inch to 10, for example), it is internally capable of multi-pitch operation. Both the Olive and Bytewriter take advantage of this fact and add control over pitch, allowing you to use 10, 12, and 15 characters per inch wheels. (Another Olivetti model, the Praxis 35, is also available—the only real difference between the 30 and 35 is that the latter has an external switch that offers the typist pitch control. Olivetti gets about $100 more for the 35 for what amounts to a 90¢ switch; it hardly seems worth it.)

Other features of the Praxis include single, space and a half, and double spacing, electronic tab and margins (no

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mechanical stops here), warning buzzer, and a "relocate" key that automatically returns the head to the last print position—a time saver when you stop typing and go back to correct a letter or word at the other end of the line.

The Printers: A Close Look

So much for the typewriter itself. What about the printers? There are three primary differences:

Perhaps the biggest difference between the two printers is that the Bytewriter is a parallel machine and the Olive is a serial machine. The two are not available in different versions. This can limit your choices depending on what port your computer has.

My Osborne, for instance, has both a serial and a parallel port. Both are unused, so my choice of printer isn't restricted. You, on the other hand, may have only one or the other port. If you have, say, an Apple, you might already have a serial card for a modem or a dot matrix printer. Unless you want to spend another $100 for a parallel card, you will probably opt for the Olive. Even if you have both ports, your choice may be limited if one is used exclusively for a particular peripheral. In any case, this is up to you to decide.

The top print speed for both the Bytewriter and the Olive is 12 characters per second.

Electronics

Another primary difference is that the electronics for the Olive are all outboard: everything is packed in a small plastic interface box. A ribbon cable joins the box to the keyboard output terminals inside the typewriter. You can disconnect the interface box from all its cables if you ever need to transport the printer, but you will have one more thing to carry, of course. By the way, the separate interface box is normally powered by a separate power supply like the one on your calculator that plugs into the wall. The supply costs $9.95 extra.

The electronics for the Bytewriter are all internal. A small connector located on the righthand side of the Praxis allows you to snap on a specially made cable (about $35 from Bytewriter) from the printer to your computer. You can make the cable yourself, too—the instructions that come with the Bytewriter tell you which pins do what. Since everything is inside the machine, there is nothing else for you to carry if you are one to tote your computer system around with you. The Bytewriter electronics use juice from the Praxis power supply.

Printing Functions

The third major difference is that several of the Olive printing functions are software controlled, whereas the Bytewriter uses small DIP switches to control its functions.

Some cases in point: To alter the pitch selection on the Bytewriter, you depress one of three switches, all of which are located on the exposed side of the built-in electronics. A pencil makes the job easier because the fit where the electronics are mounted is tight.

The keyboard toggle (KB I/KB II) must be controlled manually with the Bytewriter. For example, to create a £, it is necessary to type a shifted 2 (@ on my Osborne) on the computer. When printed out, the keyboard switch must be momentarily placed on KB II. To prevent other, unwanted special characters from being printed, it is necessary to quickly switch back to KB I.

The Olive makes this a little easier. After you have patched the program, you simply leave the switch in KB II and use a software toggle. In *WordStar* it is control-PR. Hitting control-PR again cancels the command. The Olive also allows for manual pitch selection, but you must build a jumper switch to do it.

Margins

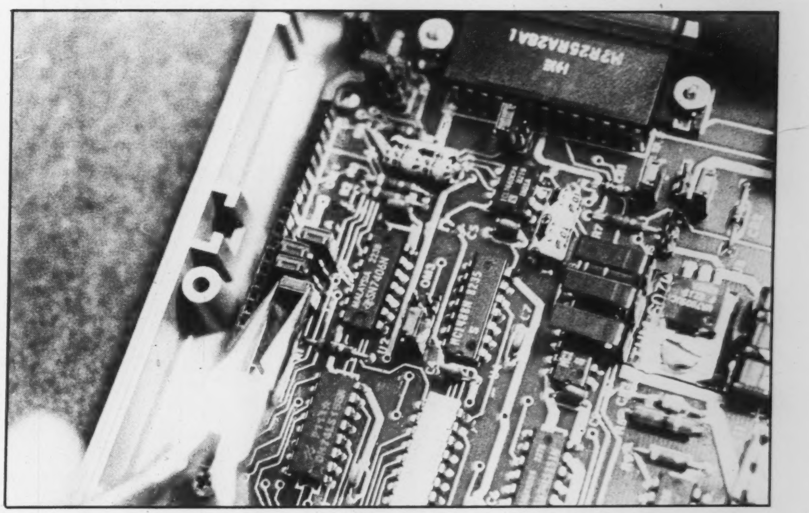
Lastly, when the Praxis is first turned on, the margins are set at 30 and 90 (for 10 pitch operation). You can change these margins if you wish, although your changes will be erased when you turn the machine off. Whether you use the default settings or your own, the Bytewriter prints within these margins. If your right margin is set at 90, you cannot print beyond that. If you attempt to print past the right margin, the Praxis will beep at you, and you will lose the rest of the characters in that line. The lesson here: When you use the Bytewriter, it is important that you move the right margin all the way over when using computer input to avoid this loss of text.

This isn't a problem with the Olive, because it resets the margins to 0 and 110 (far left and far right) immediately before it prints (your word processing program handles the margins). At the end of the printing session, the Olive restores the Praxis to its default margins of 30 to 90.

Speed

The top print speed for both the Bytewriter and the Olive is 12 characters per second (cps), which is the same as Smith-Corona's TP-1 printer, and just slightly slower than Brother's HR-1 printer. Isn't 12 cps slow? It can be if you are in a hurry. I have found that it takes about 2 to 2-½ minutes to print out a letter or a double-spaced manuscript page (that includes the time it takes for the printhead to return after each line—the Bytewriter and Olive are both uni-directional only). While the machine is doing its thing, I'm off raiding the refrigerator, checking the mail, making phone calls.

While it is possible to live with the 12 cps speed (once you get used to it), you



The Olive-80 allows for user-selectable options (explained in text). Plastic covered jumpers are used in the changes.

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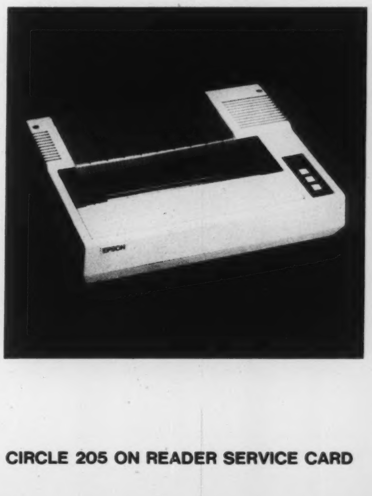

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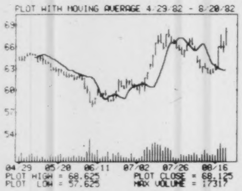

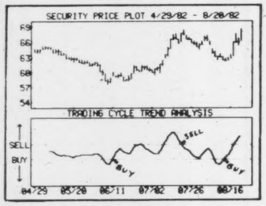

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CIRCLE 288 ON READER SERVICE CARD

Praxis, continued...

will find that some printing jobs just aren't well suited for a converted Praxis. Even though the Praxis (typewriter) has a tab key, the Praxis (printer) single spaces to each tab stop. This goes for both the Olive and the Bytewriter. (Technically it is capable of a horizontal tab; but your software must initiate the HT command—after you have manually set the tabs—rather than simply a series of spaces, as with *WordStar*.)

So if you are doing a chart, a complicated outline, or some other document that has many indentations, you will find it takes time not only to print out the characters, but for the head to align itself at the next printing position. A simple chart with twenty items took me over five minutes to print, because the items were on the extreme right-hand side of the paper. After the printhead typed one word, it returned to the left margin, single spaced all the way out to the next word, typed it, and repeated the process.

Because the Praxis is a portable machine, it isn't meant for heavy duty use. If you think of it as a printer, it is easy to forget this and run the machine day and night. Don't do it! You'll end up with a smoking hunk of metal and plastic. Ideally, the Praxis should be used for fewer than 20 pages per day. Anything more could shorten its life considerably.

In Use

The operation of the Bytewriter is fairly straightforward. You simply plug it in to any Centronics-compatible port and you're off and running. The Bytewriter does allow you one custom adjustment. The unit always responds to a line feed (LF) command by returning the printhead (carriage) and advancing one line.

The Bytewriter can be made to respond to a carriage return (CR) command in two ways: it can return the printhead and advance one line, or it can simply return the printhead. Some computers issue both a CR and an LF command at the end of a line, resulting in double-spacing (even when the typewriter is in single-space mode). The Bytewriter allows you to override this by squelching the second linefeed. This one provision also makes it possible to return the printhead to the left margin to create underlined text.

The Olive provides the above feature, along with many more independent options. Most of these options are provided because the Olive uses the serial port, which by its nature, requires peripherals to be somewhat intelligent and fast on their feet.

For example, you can change between 110, 300, and 1200 baud (which, of course, is not necessary for a parallel

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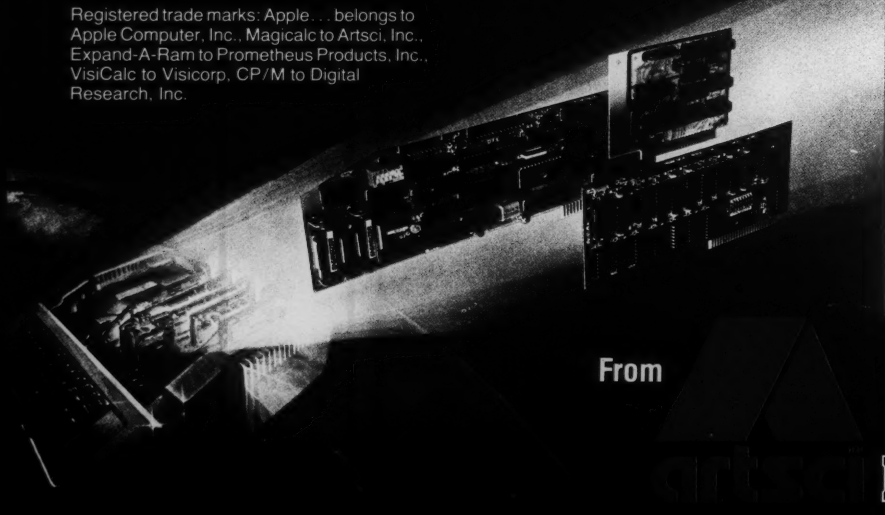

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CIRCLE 243 ON READER SERVICE CARD

Figure 1.

```
This is a sample printout (using a
Courier 12 pitch wheel and film
ribbon) from an Olive-80 printer,
a converted Olivetti Praxis 30
typewriter.  It is capable of
underlining, as well as
boldfacing.  Printer features are
controlled by software.
```

Figure 2.

```
This is a sample printout (using a
Courier 12 pitch wheel and film
ribbon) from an Olive-80 printer, a
converted Olivetti Praxis 30
typewriter.  It is capable of
underlining, as well as boldfacing.
Printer features are controlled by
software.
```

Figure 3.

```
This is a sample printout
(using a Courier 12 pitch
wheel and film ribbon)
from an Olive-80 printer,
a converted Olivetti
Praxis 30 typewriter.  It
is capable of underlining,
as well as boldfacing.
Printer features are
controlled by software.
```

printer). Handshaking, those signals that tell the Praxis and your computer what the other is doing, can be either software or hardware controlled. Software control uses the standard XON/XOFF protocol found in such printers as the Diablo 630 (so if you have software that can run with a Diablo serial printer it will probably work with the Olive without modification). When hardware handshaking is used, you can choose any of four RS-232 pins and various pin polarities. You can also power the Olive through the RS-232 cable, assuming of course that your RS-232 port has compatible engineering. All of this and more are controlled by switching a gang of jumpers inside the Olive control box.

The Bytewriter and the Olive are both capable of underlining.

While the Olive provides more flexibility than the Bytewriter, and is perfect for the user with a non-standard system, it can be more difficult to use for those with little or no technical background. Yes, the manufacturer will give you hints and suggestions on how to hook things up, but it is nice to be able to plug something in and have it work. If you are one who likes sheer simplicity, you should look into the Bytewriter.

Self-Test

It is not unusual for printers to have self-test features built in, and the Bytewriter and Olive are no exceptions. The Olive runs through a self-test—prints out two lines of each character—every time it is turned on or reset. This, admittedly, can be tiresome, so the Olive allows you to defeat this self-test.

The Bytewriter is a little different. It

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CIRCLE 216 ON READER SERVICE CARD

won't crank out a test each time it is turned on. You must hook up a jumper cable to evoke the self-test feature. The bad part? You must make the cable yourself.

The Bytewriter and the Olive are both capable of underlining. Both machines accomplish this by either backspacing, or returning the printhead and going back to the word to be underlined. With the Praxis, both ways seem to take about the same amount of time. The Olive is also capable of printing in bold face. Again, it performs this by either backspacing on each letter or doing a complete carriage return.

Ease of Use

Both the Bytewriter and Olive are easy to use, although there are some small complaints that should be covered.

Praxis Printer/Typewriter Comparison Chart.

	Bytewriter	Olive-80
Base Machine	Olivetti Praxis 30	Olivetti Praxis 30
Price	$795	$750*
Maximum Print Speed	8-12 cps	12 cps
Port Type	parallel	serial
Integral Interface	yes	no
Pitch Control	yes	yes
Underlining	yes	yes
Boldfacing	no	yes
Subscript/ Superscript	no	yes
Second Keyboard Control	yes	yes
Comes with Computer-to-Printer Cable	no	no
Features Software Controllable	no	yes
Available in Conversion Kit	no	yes
Separate Power Supply Required	no	yes**

* Conversion kit model $249, works with Praxis 30 or 35.

** Also capable of powering through properly configured RS-232 cable.

The Olive has a small reset key that is recessed into the front panel of the interface box. The hole is too small and the switch is set too far inside. Your pinky will probably be small enough to press it, but it doesn't provide a very positive feel.

The interface for the Olive comes out the front of the Praxis, then tucks underneath the machine and exits at the rear, where it continues on until it attaches to the interface box. And then of course, you have the cable between the computer and the box as well. What I found is that it is not hard to end up with a mess of cable on your desk. Although the Bytewriter doesn't have the extra length of cabling or an external box, the interface connector is located on the side of the machine, rather than the rear. Again, you can easily get lost in a thicket of cable.

If you buy a Bytewriter, you should know that Olivetti will still honor the original warranty, just as long as the fault lies within the typewriter. You can ship the machine back to Olivetti or take it to any one of dozens of regional authorized dealer repair depots. Bytewriter covers their portion of the contraption with a 90-day guarantee.

At this writing, the same doesn't go for the Olive, however. If you buy a factory-converted Praxis, your only recourse for an in-warranty repair is to send it back to The Olive Branch (located in Hayward, CA). If you convert a Praxis yourself while it is still under warranty, you void that warranty, of course. This all can change, so contact Olive for the latest details before you make your decision.

A final word about instruction manuals. The Bytewriter, being fairly simple in set-up and operation, doesn't have much in the way of a manual—about seven or eight pages worth of text. There is no technical information provided other than the pin-out assignments for the connector.

The Olive, on the other hand, is replete with information—setup, use, and technical. It comes with charts and graphs showing character sets, specifications, a sample self-test program (in Basic), and more. If you already have a Praxis 30 or 35, you can buy just the interface board from Olive and do the conversion yourself (which requires that you solder a pair of ribbon cables inside the machine). The instructions are easy to follow.

For more information on the Bytewriter, contact Bytewriter, 125 Northview Rd., Ithaca, NY 14850, (607) 272-1132; for the Olive-80, write The Olive Branch Association, Ltd., 26291 Production Ave., Suite 205, Hayward, CA, 94545 (415) 887-5633. ☐

Olivetti Praxis Conversion

The Praxis is not without its mechanical shortcomings, which can hinder proper operation in both typewriter and printer modes. One of the biggest problems is that small flakes of ink from film ribbons can clog up the sensor strip. The sensor tells the daisywheel motor where to stop to print a character. When the sensor strip is clogged, the Praxis prints out documents in some strange and totally unrecognizable tongue. The solution: spray contact cleaner on the sensor strip every few months to ensure proper operation.

Another problem involves the linefeed mechanism of the typewriter. It can get out of whack, causing uneven line spacing. You can correct the fault yourself; the instructions that come with the Bytewriter even tell you how to do it.

And third, the printing quality can sometimes be degraded when you reach the tail end of a film ribbon, or when the daisywheel mechanism is slightly misadjusted (both have happened to me). The net effect is broken characters, particularly at the bottom. If either happens much, you should contact an Olivetti dealer for repair.

Other Companies Supplying Similar Olivetti-Based Typewriter/Printers

Ammicro Corp.
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New York, NY 10168
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Ark Microsystems
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Ann Arbor, MI 48106
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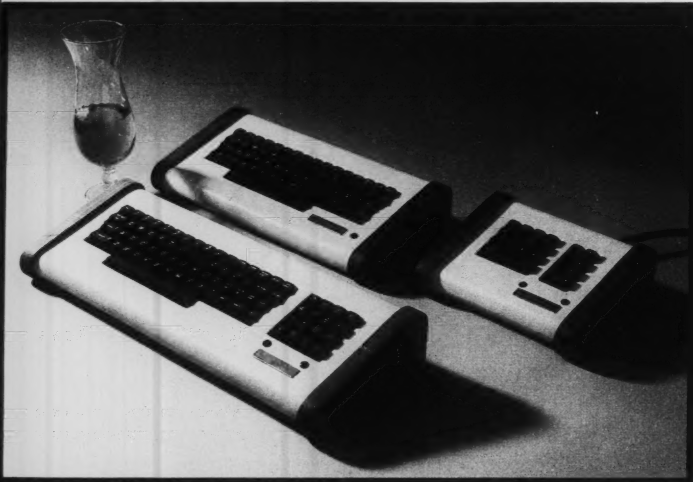

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creative computing equipment evaluation

A Printing Slave Ready to Serve

Ernest E. Mau

Have you ever considered how much time you waste waiting on your printer to catch up with your computer? Ever wonder what it would be like to print one thing while working on another? Ever face the problem of switching between a serial printer and a parallel one? Ever been disturbed by program listings printed right over the fold in your paper, running past the right margin, or formatted so that they are difficult to read? Ever wished you could get printouts with header lines and page numbers without preprocessing a text file through a word processor?

The buffering and print formatting features alone are invaluable.

All these things, and more, are possible. Commonly called "printing spoolers" or "buffered interfaces," devices do exist to aid you with varying combinations of those problems. The available equipment ranges from plug-in interface cards with their own dedicated memories, through "dumb" spoolers that do nothing more than capture data from a computer and retransmit to the printer, to truly "intelligent" printer interfaces.

Compulink Corporation's SooperSpooler, Model SS-1000, fits into that last category—an intelligent, multi-function interface. A self-contained desktop unit, SooperSpooler is a functional 2 MHz Z80 based "slave" computer installed in the communication line between the "master" computer and the printer. There it acts as a postprocessor for the data being printed. Notice that I have called it a postprocessor and not merely a buffer. A buffer would serve to capture data from the computer at its given transmission rate, store the data temporarily, and then retransmit to the printer at a rate acceptable to that device. SooperSpooler does that, but as just one of its functions.

The standard SooperSpooler configuration is equipped with 16K of RAM and two Centronics-compatible 36-pin interface ports, one for input from a computer and the other for output to a printer. It retails for $349. As separate options, the memory can be expanded to 62K ($159), and two RS-232C serial ports ($95) can be added either at the factory or as user-installed modifications. The unit I tested is the full 62K configuration with two parallel and two serial ports.

The unit can be controlled by switches, software, or both. Using just the switches, it provides a full or "hard" system reset to clear any stored data and

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b2
BUFFER STATUS
RESET
SPACE COMPRESSION
PAGE
TEST
CONSOLINK CORPORATION

Ernest E. Mau, 3108 South Granby Way, Aurora, CO 80014.

control parameters, a "soft" reset to clear just the data buffer without affecting control parameters, a complete self test of RAM and the control ROM, and several general print formatting functions.

Using just two front panel switches singly or in combination, the unit can be set for automatic space compression, automatic pagination, single sheet paper feeding, or combinations thereof.

Under software control from the master computer, all these functions plus several others accessible without using the switches are available. By transmitting the proper instructions from the master computer, it is possible to have SooperSpooler print specific headers at the top of each page, number the pages sequentially, format the page, format individual lines, and override hardware switch settings controlling interface or printer characteristics.

Under software, the page format controls affect the overall page length, the number of printed lines per page (top and bottom margins), and the position of the right printing margin with respect to the page edge. The line format controls affect both left and right printing margins and allow a selectable indent to be set for data lines that overflow from one printed line to the next. Using these controls, Basic program listings, unformatted text files, and other printouts can be printed for maximum readability.

Interfacing

The buffering and print formatting features alone are invaluable for serious computer use involving large amounts of printing. But SooperSpooler offers even more advantages in the hardware interfaces themselves. The ideal configuration is, of course, the 62K version equipped with both the dual parallel and dual serial ports. The presence of both parallel and serial communication is important when there are multiple computers or multiple printers that can be mixed and matched.

To illustrate, serial input and output can be performed at different transmission speeds because the rates are independently switch selectable. Therefore, SooperSpooler can function as a baud rate changer. Consider the case of a typical daisywheel printer having a maximum input rate of 1200 baud, which is somewhat slow when the computer might be capable of transmitting at 9600 or even 19,200 baud. With proper switch selection, SooperSpooler can accept incoming data from the computer at up to 19,200 baud and retransmit at 1200 baud while not "overrunning" the capabilities of the printer.

Furthermore, SooperSpooler can receive and retransmit data through various port combinations. Data from the computer can be received through either the serial or parallel input port and can be transmitted through either the serial or parallel output port. This means a computer with a parallel interface can output to a serial printer, or a printer with a serial interface can output to a parallel printer. It also means that one computer can drive either of two printers, either of two computers can drive one printer, or either of two computers can drive either of two printers. The only limitation is that serial and parallel printers cannot be operated simultaneously—the output port is switch selected on the SooperSpooler, but either input port is recognized without switch settings.

SooperSpooler normally cannot be used as a universal interface between two otherwise incompatible devices.

Flaws

So far, so good. I have shown that SooperSpooler has some interesting, useful, and even delightful capabilities. You are probably getting the feeling that I have developed a particular fondness for this device, and you are right. But, like any device, it has its flaws—flaws that may be more serious for some users than for others but ones that are worthy of mention.

The most annoying of all, is the location of the selection switch to change between parallel and serial printer output. It is on a dip or "pencil" switch array accessible through an opening in the rear panel of the device. This means that the unit usually must be moved and a small hooked tool such as a bent paper clip inserted into the access opening to reselect the output port (while power is off). For single computer/single printer installations this isn't a problem because there is no need for port selection after the initial installation. However, it is inconvenient when using two printers with the SooperSpooler as the switching device. There is also a risk of dislodging a cable connector in the process of moving the unit. It would have been better had Compulink designed the unit with a front switch for the port selection and "protected" that switch so the changeover could be made without turning the unit off.

There is no provision for switching the spooler off-line to make it transparent to the communication line. Certain applications such as word processing often are performed best without spooling, especially if there is any expectation of interruption. With the spooler in place, all data are buffered so the "interrupt/resume printing" functions incorporated into many programs become inoperative. By the time an interrupt is generated from the keyboard, the spooler has stored data far beyond that point, so the material continues to print.

Of course, any or all "intelligent" postprocessing features including space compression, page formatting, and line formatting, can be turned off. But this cannot be done while a printing run is in progress.

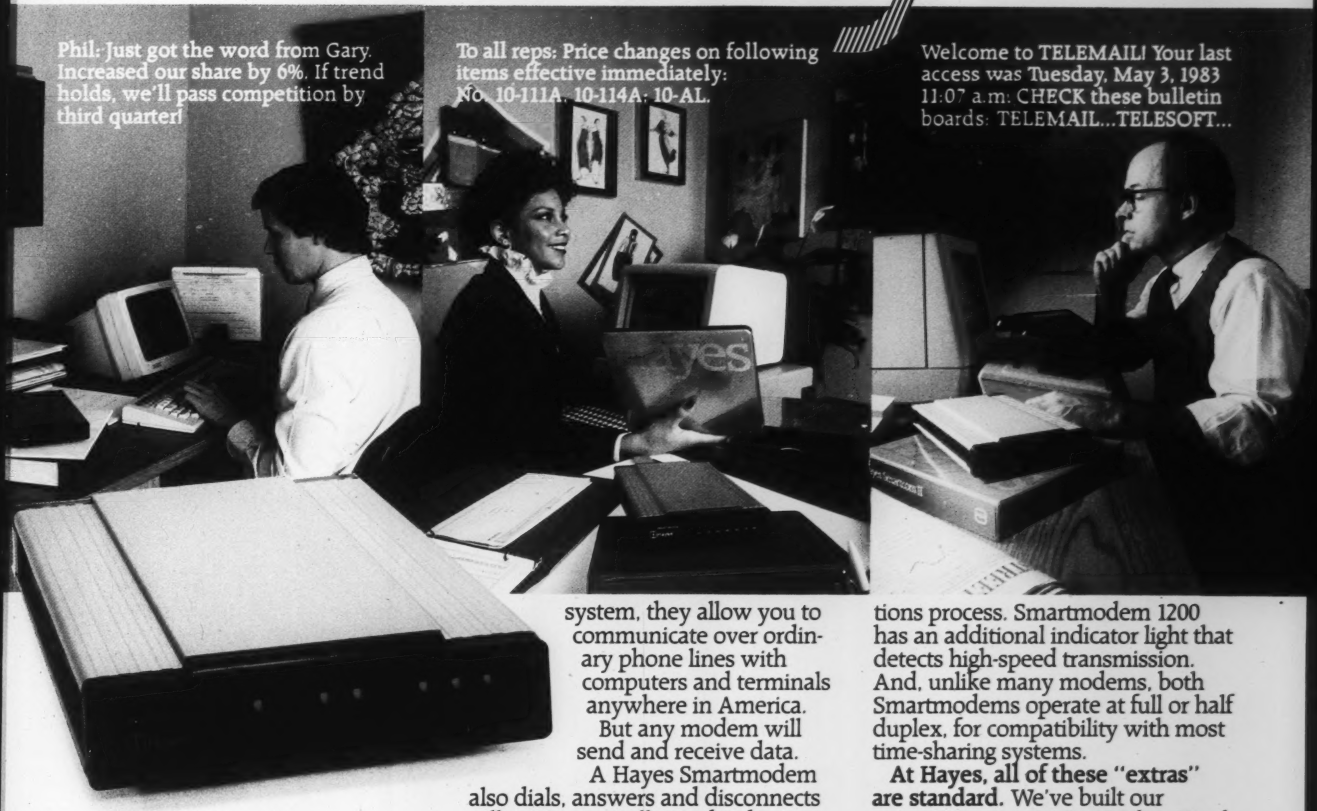
Compulink has taken steps to prevent the misconnection of devices at the ports. On the parallel side, the computer and printer connectors are rotated 180° from each other. On the serial side, however, the printer port is a male connector (plug) while the computer port is a female connector (socket). Often, printers with built-in interface cables have a male connector on the computer end, which won't mate with the male connector on the SooperSpooler without installing a separate adapter or "gender changer." Similarly, most computers are equipped with female interface connectors, requiring either a female-to-female cable from the SooperSpooler to the computer instead of the more usual male-to-female cable or another gender changer. Compulink has advised me that they will swap connectors if a unit is ordered for a particular setup such as two male serial connectors, two female connectors, or the male and female connectors reversed from the "normal" configuration.

As has been pointed out, the baud rates on the serial input and output ports are independently selectable so data may be received at one rate and transmitted at another. However, the other interface characteristics are not independent; what is selected for one port also is selected for the other. These parameters include choosing RS-232C handshaking signals vs. software protocol, seven- or eight-bit character lengths, one or two stop bits, parity type, and parity enabling.

Therefore, SooperSpooler normally cannot be used as a universal interface between two otherwise incompatible devices. If a printer won't work with a computer because of a difference in character length or protocol, SooperSpooler won't solve the problem. On the other hand, Compulink has advised me that they can equip units with special control ROMs for features such as differing protocols at the two ports offer-

Your computer's telephone.

Hayes



Phil: Just got the word from Gary. Increased our share by 6%. If trend holds, we'll pass competition by third quarter!

To all reps: Price changes on following items effective immediately: No. 10-111A, 10-114A, 10-AL.

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Inside Apple

Apple Computer Inc., 20525 Mariani Avenue, Cupertino, California 95014 Vol. 1 No. 2

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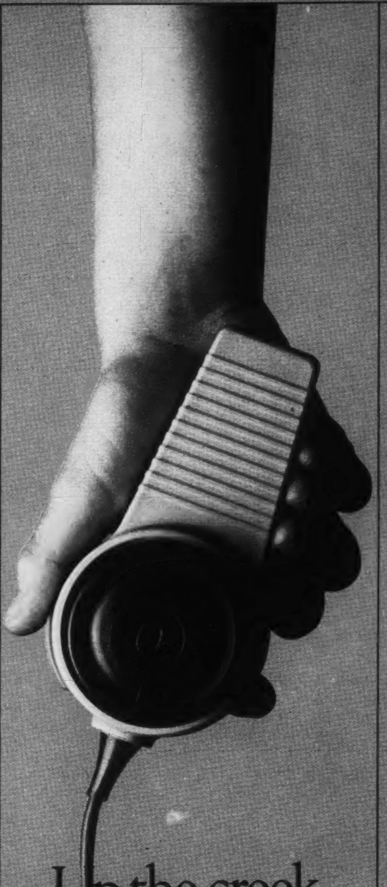

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ing this "customization" service as a product-support feature for a nominal fee.

Similarly, the serial interface doesn't account for possible variations in RS-232C signal lines such as a "2-3 crossover" needed when data transmitting and receiving lines are defined differently in the printer and master computer, jumpering particular handshaking lines, etc.

The parallel ports supposedly are "plug in and go" with optional cables available from Compulink to account for differences between various printers having Centronics-like 36-pin connectors. Yet some caution is necessary even here. There is at least one computer interface that simply won't communicate with the SooperSpooler, specifically the Interactive Structures Pkaso board for the Apple II and Epson MX-80 printer.

In general, some care must be exercised in attempting to insert a SooperSpooler between a printer and a computer interface designed specifically for that printer. Since the unit has no provision for changing any parallel port signals via switch control, it would be a good idea to verify compatibility with both Compulink and the interface manufacturer before purchasing the units.

My final observation doesn't pertain to a flaw, but an operational quirk that causes some concern when first encountered. I have noticed it only when inputting to the SooperSpooler through the serial port, and then it is most prevalent at 1200 baud. As data are transmitted from the computer, the printer activates immediately and progresses at maximum speed. Simultaneously, the digital display on the SooperSpooler starts indicating kilobytes of data in the buffer. A few seconds later, the printer begins to hesitate, reducing its printout to a half dozen or so characters per second, then resumes full speed, hesitates again, and so on. This continues until the digital indicator reaches about 5K to 7K of buffer storage, at which point the printer takes off again.

SooperSpooler is an excellent choice for a useful and usable postprocessor and printing buffer.

Apparently, data coming in from the computer take priority over data going out to the printer when only a small portion of the buffer is loaded. Therefore, printer output is halted intermittently while data from the computer are being buffered. Once the buffer is filled with several thousand bytes, the situation seems to reverse, with data going out to the printer taking priority over that coming in from the computer.

Summary

Despite these few problem areas, SooperSpooler is an excellent choice for a useful and usable postprocessor and printing buffer. It performs as advertised and as represented in the documentation. Most data transmissions are not performed to the qualifying specs, so it is not realistic to expect the transfer of 20 pages of text to be reduced from 21 minutes to 16 seconds as shown in the brochure.

The 49-page instruction manual is excellent. Written in clear, understandable language, it fully documents all the features and methods for using them. It even provides comprehensive samples of software control routines and is thoroughly indexed for quick references.

Compulink Corporation, 1840 Industrial Circle, Longmont, CO 80501, (303) 651-2014. ☐

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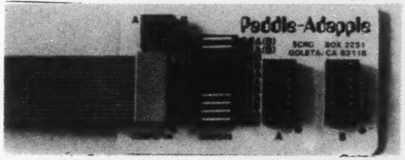
I/O EXPANSION ADAPTOR FOR APPLE] [& / /e



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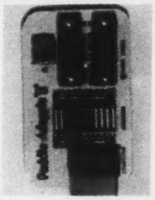

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The Power Case System

Yedidyah Langsam

One of the major disadvantages of the Apple II computer is its inability to display the lowercase alphabetic characters. Recently I had the opportunity to evaluate the Power Case System manufactured by Beaman Porter, Inc. It was a pleasant surprise to discover a product which fulfilled all my expectations and yet was eminently affordable. In use, the Power Case System is completely transparent to the programmer and enabled my department to adopt the Apple, as intelligent terminals for use with text editors available on our mainframe.

> ***The Power Case System is completely transparent to the programmer.***

About Lowercase

Before discussing the Power Case System let us review the method by which characters are represented in the Apple and ultimately displayed on the monitor. All of the characters found on the Apple keyboard are represented internally in ASCII codes 0-127. Examination of Table 1 on page 15 of the Apple II Reference Manual reveals that these codes correspond to the upper- and lowercase alphabet, the digits from 0-9, and various punctuation marks as well as various control characters and special symbols.

When these codes are sent to the monitor for display, they are first examined by a special ROM at location A4-A5 on the main board. This ROM decodes the incoming signals and sends on the proper character to be displayed to the monitor. Unfortunately, this ROM recognizes only a limited number of ASCII codes and converts those codes which it cannot display into other displayable characters. This can easily be seen by running the program in Listing 1.

It is immediately apparent that the ROM decoder does not recognize the lowercase alphabetic ASCII codes and substitutes the uppercase letters in their place.

One other major deficiency of the Apple lies with its keyboard. The SHIFT key as it is found on the Apple has no effect on the case of the letter transmitted to the CPU.

To correct the inability of the ROM chip to display all the characters represented by the ASCII code one would only have to substitute a different ROM chip in its place. The second problem, that is the inability of the keyboard to transmit the lowercase codes, is slightly more difficult.

For example, suppose you depress only the A key without shifting. We would expect that the ASCII code 97 representing a lowercase *a* would be sent to the chip. Unfortunately, the Apple keyboard sends an ASCII 65 representing an uppercase *A*. One way to solve

Listing 1.

```
100  INVERSE : GOSUB 900

200  FLASH : GOSUB 900

300  NORMAL : GOSUB 900

400  END

900  FOR I = 32 TO 127

910  PRINT CHR$ (I)

920  NEXT I

930  PRINT; PRINT

940  RETURN
```

Yedidyah Langsam, Department of Computer and Information Science, Brooklyn College of C.U.N.Y., Brooklyn, NY 11210.

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this problem is to write a software routine that examines incoming codes from the keyboard and transforms them to their lowercase counterparts unless a SHIFT key is depressed.

Unfortunately, and this is the catch, the SHIFT key on the Apple does not possess a code of its own, so our routine has no way of detecting whether or not the SHIFT key has been depressed.

This problem can be solved by attaching a wire from the shift key to the game socket and having our software examine the game socket for a signal. If a signal is detected at the game socket our routine lets the uppercase ASCII code through without converting it to lowercase.

This is exactly what is done by the Power Case System. Power Case is an upper/lowercase system for the Apple II revision level 7 or greater (1980 and later). It is easily installed and produces one of the clearest and crispest character sets available. The Power Case System comes with a replacement ROM chip to generate the new character set and a micro-hook jumper to connect the SHIFT key to the game socket without any soldering or other permanent changes to the Apple. In addition to the clear and easy to follow manual, the Power Case System includes, on a double sided 16-sector disk, the software routines to effect the upper/lowercase SHIFT key modification written for both Applesoft under DOS 3.3 and UCSD Pascal.

The instructions were so easy to follow, I made the modification in under 15 minutes. The installation procedure is outlined in 12 easy steps accompanied by photographs. The entire procedure is reversible so that the Apple can be returned to its original condition without voiding the warranty.

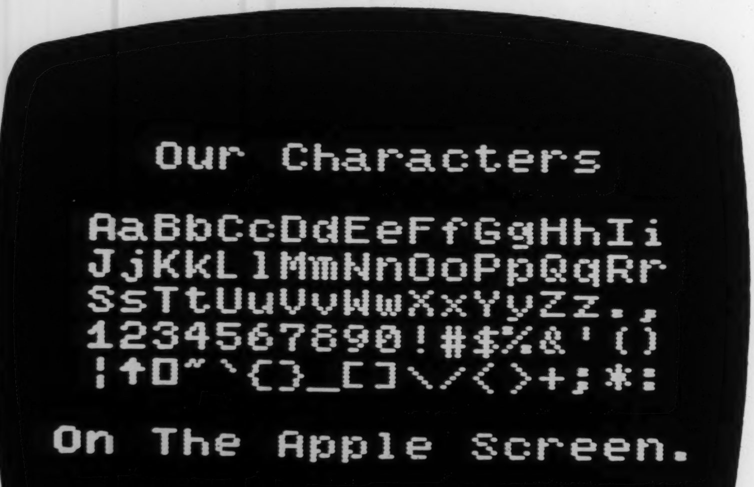
Using the System

Using the Power Case System is equally simple. An ESC ESC sequence provides the alpha shift lock. A flashing cursor indicates uppercase. The Power Case System also provides the user with many non-alphabetical characters which were previously unavailable. For example, typing ESC produces a backslash; other ESC sequences provide for {, } , [,], and many others.

The only thing that takes some getting used to is that the cursor moves previously obtained by an ESC I, J, K or M sequence are replaced by the sequence ESC CTRL-W CTRL-A. CTRL-S or CTRL-Z respectively. Another aspect that might at first be confusing is that Applesoft, Integer, and DOS don't understand lowercase. If you type list the computer will respond with syntax error. All you have to do is place the keyboard into caps-lock and the computer will respond to LIST as before.

In addition to the basic UCLC.D routine provided on the disk you will also find programs called KEYPRINT and UCLC.P. The former is simply a program to display the ASCII code name (cr, lf, null, etc.) or decimal value of any key pressed.

UCLC.P is a routine very similar to UCLC.D except that the key sequence used to provide the various additional functions provided by the Power Case System are the same as those used to provide the corresponding functions while using Pascal. Thus a programmer who works with both Pascal and Basic will not be confused by two different key sequences.



```
Our Characters

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JjKkLlMmNnOoPpQqRr
SsTtUuVvWwXxYyZz.,
1234567890!#$%&'()
¦↑□~`{}_[]\/<>+;*:

On The Apple Screen.
```

To use the Power Case System from Pascal, a routine for updating the SYSTEM.APPLE file on the APPLE1 disk, is provided on the reverse side of the Power Case disk. Clear and easy to follow instructions for updating SYSTEM.APPLE using either a one- or two-drive system are given in the instruction manual. Once the update has been performed, an entire array of functions is added to those previously available with the Pascal System.

The Power Case System works very well under CP/M.

Since I am not familiar with the Apple Pascal System, suffice it to say that the documentation provided seems clear and complete. The Power Case System was initially designed to be used with the *Power Text Word Processing System* (also a product of Beaman Porter) which is a Pascal System. You are, therefore, assured that Pascal and the Power Case System are totally compatible.

Although no mention of CP/M and the Z80 softcard can be found in the Power Case documentation, I have found that the Power Case System works very well under CP/M. CP/M, as provided with the Z80 softcard, is configured to change all lowercase characters into uppercase letters. Using the CONFIGIO routine as described on page 5-16 of the Microsoft Softcard documentation, the CP/M system disk may be reconfigured to take advantage of the Power Case ROM chip to display lowercase text. For upper/lowercase text, the Microsoft Softcard documentation contains a simple machine language routine which can be patched into the CP/M BIOS system.

As far as compatibility of Power Case with smart terminal packages, I have used it successfully with both *Data Capture 4.0* and *Z-Term* to communicate with Compuserve and other time-sharing systems.

In conclusion, the Power Case System is easy to use and works well with all three commonly used Apple operating systems. It is nice to see a product which delivers what it promises at a very affordable price. I can recommend this product without any reservation.

Beaman Porter, Inc., Pleasant Ridge Rd., Harrison, NY 10528. ☐

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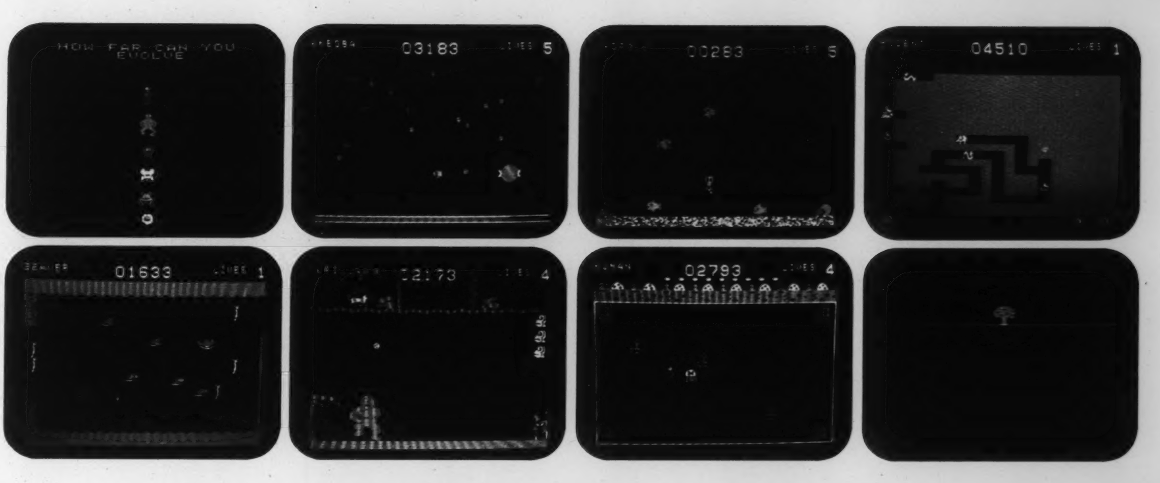

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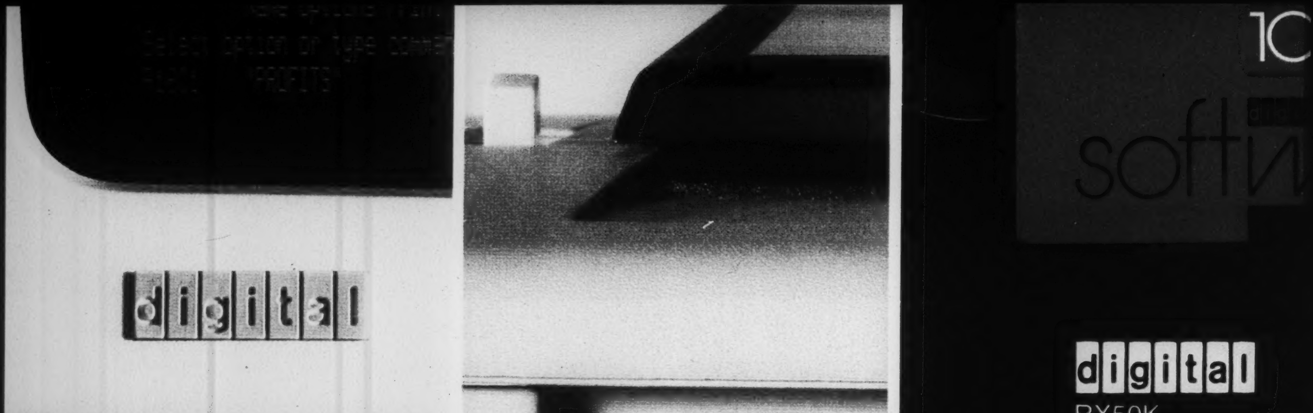
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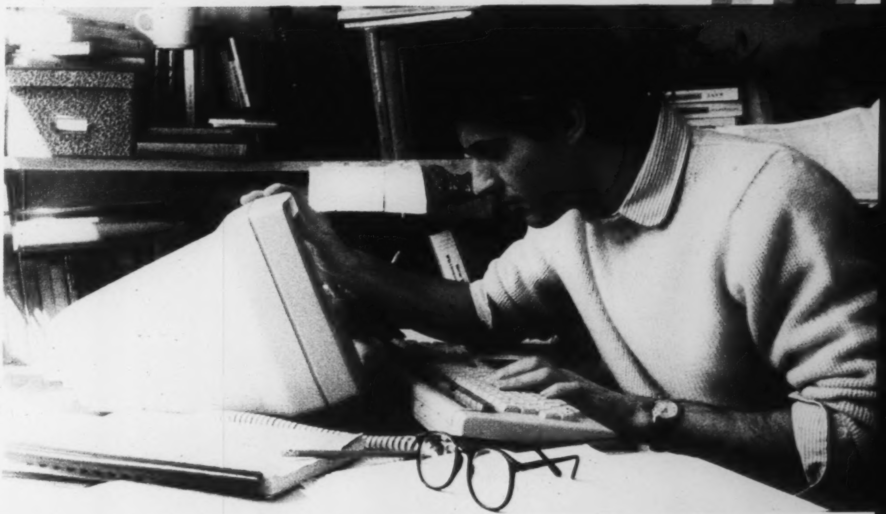

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CIRCLE 228 ON READER SERVICE CARD

A Speed Up Modification For The TRS-80

creative
computing
equipment
evaluation

Sprinter II

In my work as a neurophysiologist, I designed a simulation of a nervous network to run on a microcomputer. The only trouble was, to get a statistically significant sample of output from the simulation, I had to run the model for 2½ days on our HP-85. Something had to be done!

Actually, more than one thing. These things included changing from an HP-85 to a TRS-80, rewriting the simulation in a compiled language (Alcor Pascal), and increasing the speed of my computer. But which modification to use? Points of concern were:

1. How easy is the modification to make?
2. How much speed increase will there be?
3. Will it actually deliver?
4. Will it work under all the conditions necessary to gather and analyze the data?

After looking at the options available, I made what appeared to be the best choice, Holmes Engineering's Sprinter II.

Sprinter II, which lists for $99, is the fastest speed up modification for the TRS-80 Model I and III currently available. It is also the easiest to install and one of the least expensive. The Sprinter II gives you 16 different speeds from which to choose, all integer multiples or dividends of the standard 1.77 MHz clock speed. For Model I machines without an expansion interface, an optional printer port can be provided as well for an additional $24. Since I have a disk system, I did not need the printer port.

Bruce Powel Douglass

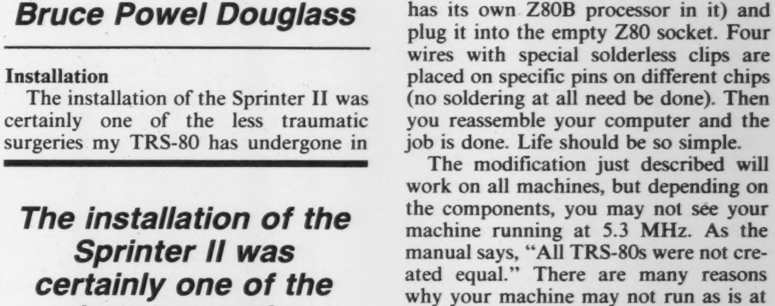
Installation

The installation of the Sprinter II was certainly one of the less traumatic surgeries my TRS-80 has undergone in its short life. First, you remove the cover of the keyboard, and (carefully!) remove the Z80 chip from its socket. A flat screwdriver works well for this. Then, you take the Holmes Sprinter II (which has its own Z80B processor in it) and plug it into the empty Z80 socket. Four wires with special solderless clips are placed on specific pins on different chips (no soldering at all need be done). Then you reassemble your computer and the job is done. Life should be so simple.

> ***The installation of the Sprinter II was certainly one of the less traumatic surgeries my TRS-80 has undergone in its short life.***

The modification just described will work on all machines, but depending on the components, you may not see your machine running at 5.3 MHz. As the manual says, "All TRS-80s were not created equal." There are many reasons why your machine may not run as is at 5.3 MHz. Most computers will run at a clock speed that is less than 5.3 MHz, but nevertheless faster than the normal 1.77 MHz.

For example, some TRS-80s were made with RAM chips that run at 450 ns rather than the current standard of 200 ns or 150 ns. You may have to replace these to run your TRS-80 at three times normal speed. Or, you may have to solder 1K resistors to avoid loading the RAM chips, etc. However, the man-



The Sprinter II from Holmes Engineering.

Bruce Powel Douglass, 1005 W. Main, Vermillion, SD 57069.

ual states that in all cases, the manufacturer has been able to get a TRS-80 to run at 5.3 MHz with extra wait states for memory access. If worse comes to worse, you can send your keyboard unit to them, and they will make the installation for you and charge you for the parts and labor necessary for modifications they will have to make to get the machine working at 5.3 MHz. The manual describes a number of fixes for machines that won't run at top speed.

My own experience was that installation of the Sprinter II enabled the machine to run at twice normal speed, but it just wouldn't run at three times normal speed. I talked to the helpful engineers at Holmes and discussed my problems. We decided that the modifications necessary to get it working at three times normal speed (5.3 MHz) were beyond my admittedly meager soldering abilities, and I packed my keyboard off to them to make the modifications (I *really* wanted to get it running at 5.3 MHz!). The service bill was a modest $60 for labor and parts—a most worthwhile investment.

The installation manual is clear and concise. It has photographs to show exactly where the solderless clips should be attached, and which trace to cut in an optional modification that really ought to be made. The manual explains how to take the cover off the computer and how to put the screws back in when you are done. The most inexperienced hacker should be able to follow the manual without error.

The troubleshooting guide describes common problems and solutions. These all refer to errors you may have made in the installation procedure or to particular parts in your system that may be failing at high speed. The manual also describes some optional modifications to disable the automatic changes back to normal speed during cassette or disk I/O. The Sprinter II automatically returns to normal speed when one of these operations takes place, and then returns to its previous speed when the I/O is completed. These optional changes allow you to run high-speed tapes, and double density 8" floppy disk drives. The unmodified TRS-80 cannot operate an 8" drive.

Listing 1.

```
 ;      FAST/ASM - ROUTINE TO RUN @ 5.3 MHZ
          ORG       0FE00H              ;on top of ol' memory
 SCRN     EQU       3C00H               ;Screen location
 DISP     EQU       28A7H               ;Display string ROM call
          LD        A,3                 ;for string output flag
          LD        (40AFH),A           ;store flag
          LD        A,0C9H              ;RET
          LD        (41C1H),A
          LD        (41D0H),A
          LD        A,12                ;speed up to 5.3 Mhz with wait states
          OUT       (254),A             ;do it!
          LD        HL,MESS             ;points to message
          CALL      DISP                ;print message
          JP        402DH               ;back to DOS
MESS      DEFM      '             TRS-80 NOW RUNNING AT 5.3 MHZ CLOCK'
          DEFB      00H       ;end message with a 00H byte
          END       0FE00H
```

Running The High Speed Mod

Controlling the clock speed couldn't be easier. The control for clock speed is all software. The BASIC OUT 254,X statement is used to adjust the speed anywhere from ⅓ normal speed to three times normal speed. Your TRS-80 may not work at some of these speeds for the reasons mentioned above. A little experimentation will show you which is the fastest speed for your machine.

Machine language can also be used to control speed. Since TRS-80 DOSes don't allow an OUT from DOS, I wrote the simple assembly language program, Fast, shown in Listing 1.

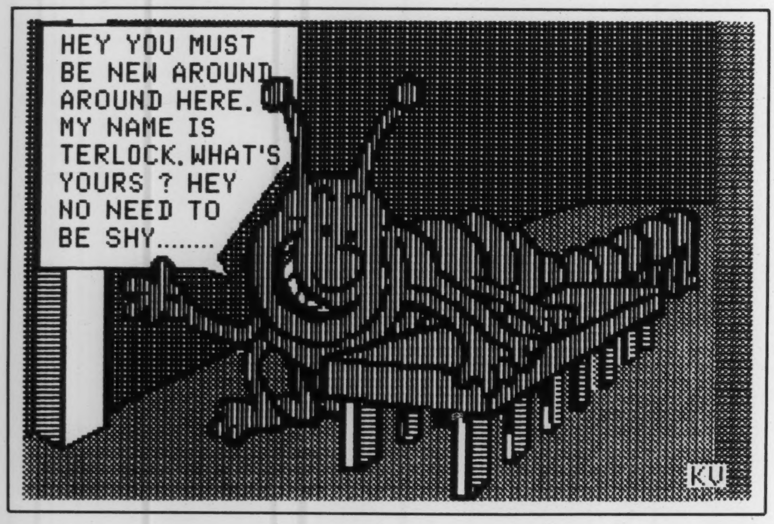
Fast is a simple program that executes automatically at a system boot. It outputs a 12 to port 254, displays a message to that effect, and then returns to DOS. I wrote another program called Slow, which returns the machine to the normal 1.77 MHz clock speed by sending a 0 to the port (it hasn't been used yet). Using the Sprinter II is that simple.

Although initially I could get my TRS-80 to run at only twice normal speed, Holmes Engineering installed the necessary modifications to enable it to run at 5.3 MHz with wait states added during memory access. I have used the modification without any problems whatsoever on any programs, including database management programs, compilers, statistical and other mathematical analysis programs, and programs to load neurological data from an external A/D converter connected to electrodes stuck in my pet leeches. I boot, my DOS automatically executes Fast, and I go (quickly) from there.

The biggest problem I have had with it is rewriting the timing loops in Basic and machine language programs because my TRS-80 is executing so fast. If you play games that play music, the music will, of course, be much faster. A simple fix for that would be to find the music output routine in memory and have it multiply the value for the tone length delay constant by the command of the increase in speed, and then execute the tone. For a machine running at twice normal speed, you shift the number left one bit, so it's quite easy to program.

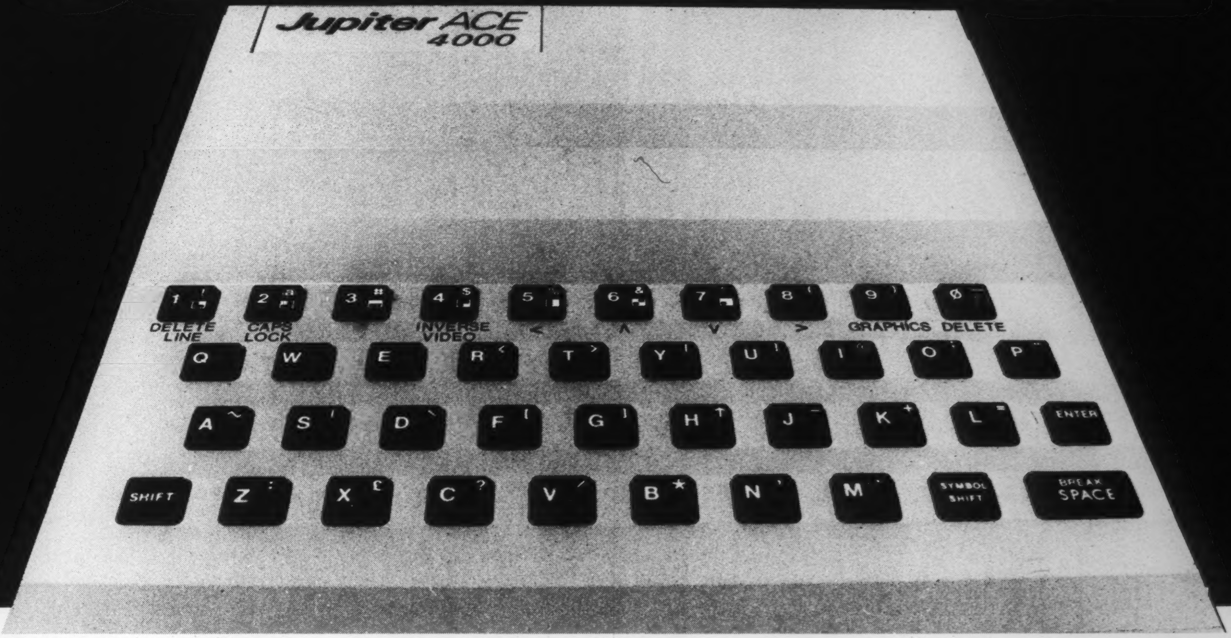
If you find your TRS-80 a little slow starting in the morning, try a healthy dose of Sprinter from Holmes Engineering. It is an inexpensive but high quality modification that is truly easy to make and to use. By the way, my simulation now runs in 15 minutes.

Holmes Engineering, 3555 South 3200 West, Salt Lake City, UT 84119. ☐



CIRCLE 411 ON READER SERVICE CARD

Introducing The JUPITER ACE


Jupiter ACE 4000
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Wide Angle Atari

Arlan Levitan

Group Commander Ahta Reeh checked the Galactic Map and pinpointed what was surely the last pocket of Zylon resistance in Sector 707. "It's about time," the stalwart defender of the universe thought. "Let's get this over with. I've got some heavy duty word processing to do this evening."

Star Cruiser Seven made the hyperspace jump with ease and materialized within 50 centons of what the battle computer identified as an all too familiar Tie Fighter. A wave of compassion swept over Reeh, who thumbed the subspace radio on and beamed an offer of clemency to the doomed Zylon ship.

> **The combination of an 80-column text display and the right software can greatly enhance the utility of a personal computer.**

"Drop your shields and surrender, General Rejistor. I've no desire to shed any more green blood today."

The alien's reply was more hissed than uttered. "We Zylons do not bargain with crude savages armed with preatomic tools . . .even your battle computer displays are only a pitiful forty columns wide!"

Reeh's grip on the phaser bank trigger slowly tightened . . .

Meanwhile, Back on Earth . . .

Believe it or not, there are life forms around today that echo sentiments similar to those of our fictional Zylons. Namely, that if a computer doesn't have an 80-column display, it can't be taken seriously. While such a position is rather extreme, it must be acknowledged that the combination of an 80-column text display and the right software can greatly enhance the utility of a personal computer for some users.

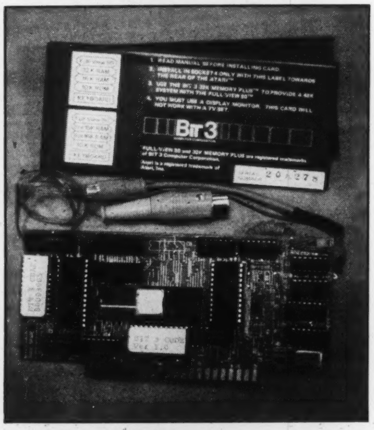
Microcomputer owners who regularly access computer time-sharing systems are among those who can benefit. Most large and medium sized commercial computer systems are customarily accessed with video terminals that display 24 lines of text, with 80 characters per line. Many data processing professionals use personal computers to work from home during off hours, and working with 80-column format material on a 40-column screen can be quite confusing, especially if column-oriented data are involved.

A standard feature of many professional word processing systems is the ability to format text to a screen display that can accurately preview how a document will look on paper before actually printing it. Errors that require reformatting text or changing data may be caught before subjecting your printer to unnecessary wear and your wallet to paying for wasted paper.

In short, more data on the screen can mean more usable information presented to you, the user, at one time.

Special circuit cards that make it possible for computers such as the Apple II to display 80 columns rather than the usual 40 have been available for several years. The Bit 3 Computer Corporation has drawn upon its experience in this area and released an 80-column board designed to expand the text display capabilities of the Atari 800 computer. Before getting into the details of Bit 3's Full-View 80 board, a discussion of why many home computers, including the Atari, are designed to display fewer than 80 characters per line is in order.

The designers of the Atari 800 personal computer structured the text and graphics displays of the system around the capabilities of the most common color video display device found in the home, the television set. While this design eliminated the need for Atari own-



Bit 3 80-column board.

Arlan R. Levitan, 12709 Borgman, Huntington Woods, MI 48070.

Word Perfect

A word processor should be an extension of your mind.

A good word processor should feel comfortable, and let you put your thoughts down quickly, almost effortlessly. It should have automatic everything, and include footnotes, merge, columns and math. The screen should be uncluttered and give you an honest view of your text without annoying codes.

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CIRCLE 268 ON READER SERVICE CARD

CAN A COMPUTER MAKE YOU CRY?

Right now, no one knows. This is partly because many would consider the very idea frivolous. But it's also because whoever successfully answers this question must first have answered several others.

Why do we cry? Why do we laugh, or love, or smile? What are the touchstones of our emotions?

Until now, the people who asked such questions tended not to be the same people who ran software companies. Instead, they were writers, filmmakers, painters, musicians. They were, in the traditional sense, artists.

We're about to change that tradition. The name of our company is Electronic Arts.

SOFTWARE WORTHY OF THE MINDS THAT USE IT. We are a new association of electronic artists united by a common goal — to fulfill the enormous potential of the personal computer.

In the short term, this means transcending its present use as a facilitator of unimaginative tasks and a medium for blasting aliens. In the long term, however, we can expect a great deal more.

These are wondrous machines we have created, and in them can be seen a bit of their makers. It is as if we had invested them with the image of our minds. And through them, we are learning more and more about ourselves.

We learn, for instance, that we are more entertained by the involvement of our imaginations than by passive viewing and listening. We learn that we are better taught by experience than by memorization. And we learn that the traditional distinctions — the ones that are made between art and entertainment and education — don't always apply.

TOWARD A LANGUAGE OF DREAMS. In short, we are finding that the computer can be more than just a processor of data.

It is a communications medium: an interactive tool that can bring people's thoughts and feelings closer together, perhaps closer than ever before. And while fifty years from now, its creation may seem no more important than the advent of motion pictures or television, there is a chance it will mean something more.

Something along the lines of a universal language of ideas and emotions. Something like a smile.

The first publications of Electronic Arts are now available. We suspect you'll be hearing a lot about them. Some of them are games like you've never seen before, that get more out of your computer than other games ever have. Others are harder to categorize — and we like that.

WATCH US. We're providing a special environment for talented, independent software artists. It's a supportive environment, in which big ideas are given room to grow. And some of America's most respected software artists are beginning to take notice.

We think our current work reflects this very special commitment. And though we are few in number today and apart from the mainstream of the mass software marketplace, we are confident that both time and vision are on our side.

Join us.

We see farther. ELECTRONIC ARTS™

CIRCLE 170 ON READER SERVICE CARD

SOFTWARE ARTISTS? "I'm not so sure there *are* any software artists yet," says Bill Budge. "We've got to earn that title." Pictured here are a few people who have come as close to earning it as anyone we know.

That's Mr. Budge himself, creator of PINBALL CONSTRUCTION SET, at the upper right. To his left are Anne Westfall and Jon Freeman who, along with their colleagues at Free Fall Associates, created ARCHON and MURDER ON THE ZINDERNEUF.

Left of them is Dan Bunten of Ozark Softscape, the firm that wrote M.U.L.E. To Dan's left are Mike Abbot (top) and Matt Alexander (bottom), authors of HARD HAT MACK. In the center is John Field, creator of AXIS ASSASSIN and THE LAST GLADIATOR. David Maynard, lower right, is the man responsible for WORMS?

When you see what they've accomplished, we think you'll agree with us that they can call themselves whatever they want.

“What if . . . I want it faster?”

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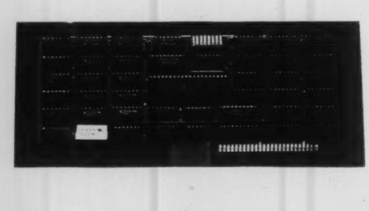

The Accelerator II is designed for the Apple II and II Plus. The Acclerator IIE will be available soon for the Apple IIE. The Accelerator boards are based on a fast 6502 processor with its own memory and built-in, high speed Language Card. The fast 6502 runs in parallel with the Apple's standard 6502. It's like putting an extra, faster Apple inside your original Apple.

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See your local computer dealer or contact Saturn Systems for more details. In Europe, contact Pete and Pam Computers, New Hall Hey Road, Lancashire, UK; Telephone 706-227-011, Telex 635740 PET PAM G

VisiCalc is a registered trademark of VisiCorp. Apple is a registered trademark of Apple Computer, Inc.

The VisiCalc expansion software (VC-Expand, etc.) is written for Saturn by Micro Solutions, Inc.

SATURN SYSTEMS INC.

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Ann Arbor, MI 48107
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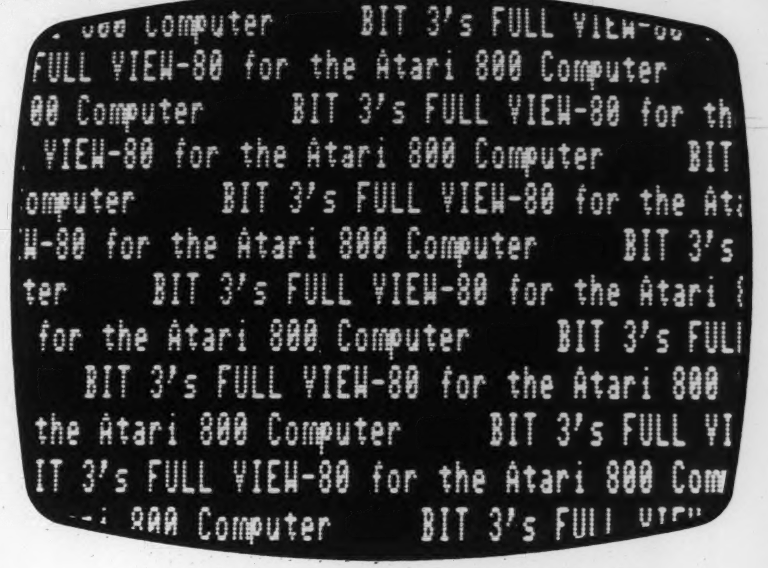
CIRCLE 278 ON READER SERVICE CARD



```
 800 Computer     BIT 3's FULL VIEW-80
FULL VIEW-80 for the Atari 800 Computer
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the Atari 800 Computer     BIT 3's FULL VI
IT 3's FULL VIEW-80 for the Atari 800 Com
 800 Computer     BIT 3's FUL
```

A look at the 80-column character set of the Full-View 80.

ers to purchase a special monitor, it did impose certain limits upon the amount of text that could be displayed.

Living Within Limits

A measurement referred to as bandwidth is the major determinant of the number of separate dots per line that may be clearly displayed. It is not necessary for us to get into the mathematics involved in determining bandwidth. All you need to remember is that the higher the rated bandwidth of a monitor, the finer its horizontal display can be. To display clearly the output of the Full-View 80, Bit 3 recommends a display monitor having a minimum bandwidth of 10 MHz. The average color TV has a bandwidth of only 3 MHz, and even the best component color monitors driven by standard video signals are rated at only 6 MHz.

Why do we need a monitor with such a high bandwidth? All because of a tiny creature called a pixel—the smallest separate dot of light that can be displayed by most computers on a video screen. The Atari 400 and 800 can display a maximum of 320 such dots on a single horizontal line, and can stack 192 such lines up to fill the TV screen. The Atari display is therefore said to have a maximum display resolution of 320 × 192. This is very close to the maximum number of pixels that the TV itself can display.

The screen editor on the Atari displays each text character as a pattern of lighted dots within an 8 × 8 matrix or cell. Dividing the horizontal and vertical resolution by the number of pixels each character uses, we arrive at a display of 320/8 × 192/8 or 40 × 24.

Can't we squeeze more text onto each line by using a smaller matrix for each character? Yes, but doing so reduces the legibility of the display as the width of each character narrows. Software packages that display 64 or 80 characters per line by using smaller cell width usually also provide the user with a good case of eyestrain.

Eighty-column boards overcome the limits of resolution built into many personal computers by incorporating independent circuitry capable of generating extremely high resolution monochrome displays. The Full-View 80 uses an 8 × 10 cell matrix for each of the 80 characters on each display line. The resolution of the 80-column by 24-line display is therefore 640 horizontal by 240 vertical pixels. The large number of dots in the display is why the FV80 requires a high-resolution monitor. The introduction of the 24-page user manual and the label on the board clearly state that the unit will not work with a TV set.

This makes a high quality monochrome monitor the most logical choice for use as a display unit with the FV80. Such monitors typically range in price from $100 to $250 and are available in a variety of display colors. Green phospor displays are generally the easiest on the eyes, but black and white and even amber displays are available to suit individual tastes. I used a Kaga Model KG12N 12" green phospor monitor (one of those recommended by Bit 3) to make the photographs that appear here.

Even a novice will find installation of the FV80 easy to accomplish by following the clear instructions given in the manual. The board simply plugs into the last memory slot of the Atari. A thin, flat set of wires attached to the FV80 is run out of the memory cage and the system cover is reinstalled. Metallic tape is supplied to keep the cover from cutting into the flat ribbon wire. The wire terminates in two separate plugs. One is connected to the five-pin jack on the right side of the 800, the other to the monitor.

While there is no minimum RAM requirement for using the device, this hardware set-up does impose a few restrictions.

Since the FV80 uses the last memory slot in the Atari, a 32K memory board must be used in conjunction with one 16K card to run a full 48K system. Although Bit 3 recommends their own Memory-Plus board, any good quality 32K unit will suffice.

Also, if you are already using that five-pin jack to feed the Atari audio signal through your stereo system or a color video signal into a TV with video input jacks, it will be necessary to build a simple Y-connector to continue doing so.

Operation

The Bit 3 board did not interfere with any of the regular Atari software I ran. The on-board circuitry of the FV80 remains dormant unless it is specifically activated. The simplest way to do this is to type A=USR(54818) directly from Atari 8K cartridge Basic. This jumps to a routine located in an EPROM on the FV80 board that works some internal magic (actually, it installs the FV80 as a new device in the device table and redirects output normally vectored to the screen editor to the Bit 3). The screen blinks, clears, and the familiar READY prompt from Basic appears at the top of the now 80-column display. Happily, any program that was in memory before the USR jump will still be there.

The character set produced by the board is crisp and readable. All the full screen editing capabilities of the Atari are retained and some new functions are added. CTR-Cf toggles the cursor character between an underline and the familiar inverse block. All characters on a single line to the right of the cursor may be erased by typing. CTRL-E. On the drastic side is CTRL-S which will erase everything on the screen past the present cursor position. I soon found that I preferred the underline cursor and that the delete to end of line feature was a real plus.

Another feature is described as a Video Switch. The manual makes it sound as though you can flip between

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Full-View 80, continued...

40- and 80-column displays by typing CTRL-A and CTRL-B respectively. This is not exactly the case. What the switch does do is flip between text and Atari graphics modes. Once turned on, the FV80 display is automatically deactivated by graphics modes other than zero and reactivated by returning to graphics 0. This makes it possible to alternate 80-column text displays and graphics screens under program control.

If any of the control codes normally interpreted by the FV80 as editing or function commands are required to be entered as text, the character must be preceded with an escape code (ESC), or alternatively, all control code execution may be deselected with a single POKE.

Caveats

Although the performance of the FV80 is quite satisfactory, a few caveats are in order. This is a new device, the first of its kind for the Atari, and I did discover some flaws in the Bit 3 unit, all of them involving the on-board control software:

The character set produced by the board is crisp and readable.

CTRL-3 is not supported as end of file for the screen editor. Some software makes use of this feature. I found myself "lost in the ozone" after preparing a screen full of data and attempting to enter an EOF by typing CTRL-3.

The graphic representations of the characters for CTRL-F, G, H, J, ;, comma and period are wrong on the FV80. For example, a CTRL-F printed as a graphics club. Even though machine language strings containing any of these characters were incorrect in their screen appearance, they were correct internally and functioned properly. A factory technician stated that correct representations of these characters were attempted at first and were judged to be visually displeasing. Bit 3 subsequently opted to substitute other characters for them and does not plan to correct the situation at this time.

A GRAPHICS 0 statement does not clear the screen and position the cursor at the top of the diplay.

Although the speed of the display under most circumstances is fine, the execution of the Insert Line function is noticeably slothlike.

Fortunately, items one and three can be remedied by changes to the FV80 firmware. According to Bit 3, new EPROMs incorporating such revisions

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Full-View 80, continued...

will be made available at nominal cost to present FV80 owners in the near future. The technical staff at the factory returned all of my calls promptly and were extremely courteous and helpful. Bit 3's confidence in the board is evidenced by a one-year warranty, a welcome change from the usual three-month guarantees so prevalent these days.

The manual contains a good deal of technical information, including descriptions of firmware and hardware characteristics, and instructions for making custom character sets for those who have access to EPROM burners. The FV80 character set is not redefinable on the fly, as is the standard Atari display.

A short list of compatible software is also provided, as well as instructions for using the board with Atari Microsoft Basic. At this time, only one manufacturer has committed to produce packages written especially for the Full-View 80. Before rushing out and spending $349.95 on an FV80 board, and another healthy chunk of cash for a monochrome monitor and 80-column software, you would be well advised to insure that the software available fully meets your expectations and anticipated needs.

Although many straight text-oriented Basic programs may work without major modification on the FV80, much software will not, and modifying existing software is out of the question for most casual users. For example, I was able to get my all machine code smart T.H.E. Terminal program to work with 80 columns only because the author, Tom Giese, is a fellow MACE (Michigan Atari Computer Enthusiasts) member and was willing to drop by and work things out. The average user just can't count on support like that. Even those with some degree of skill can forget about modifying protected software.

The only word processing package currently available that takes advantage of the FV80 is *Letter Perfect* from LJK Enterprises in St. Louis, Mo.

Hardware does not make software happen by virtue of its very existence. If the Full-View 80 is to gain wide acceptance, Bit 3 must actively promote the product within the software development community. Hopefully, existing products such as word processors, terminal programs and databases will be modified to support both 40- and 80-column modes at little or no additional charge. Let's hope more software authors are bitten by the 80-column bug. The Full-View 80 hardware is ready for them and is certainly up to snuff.

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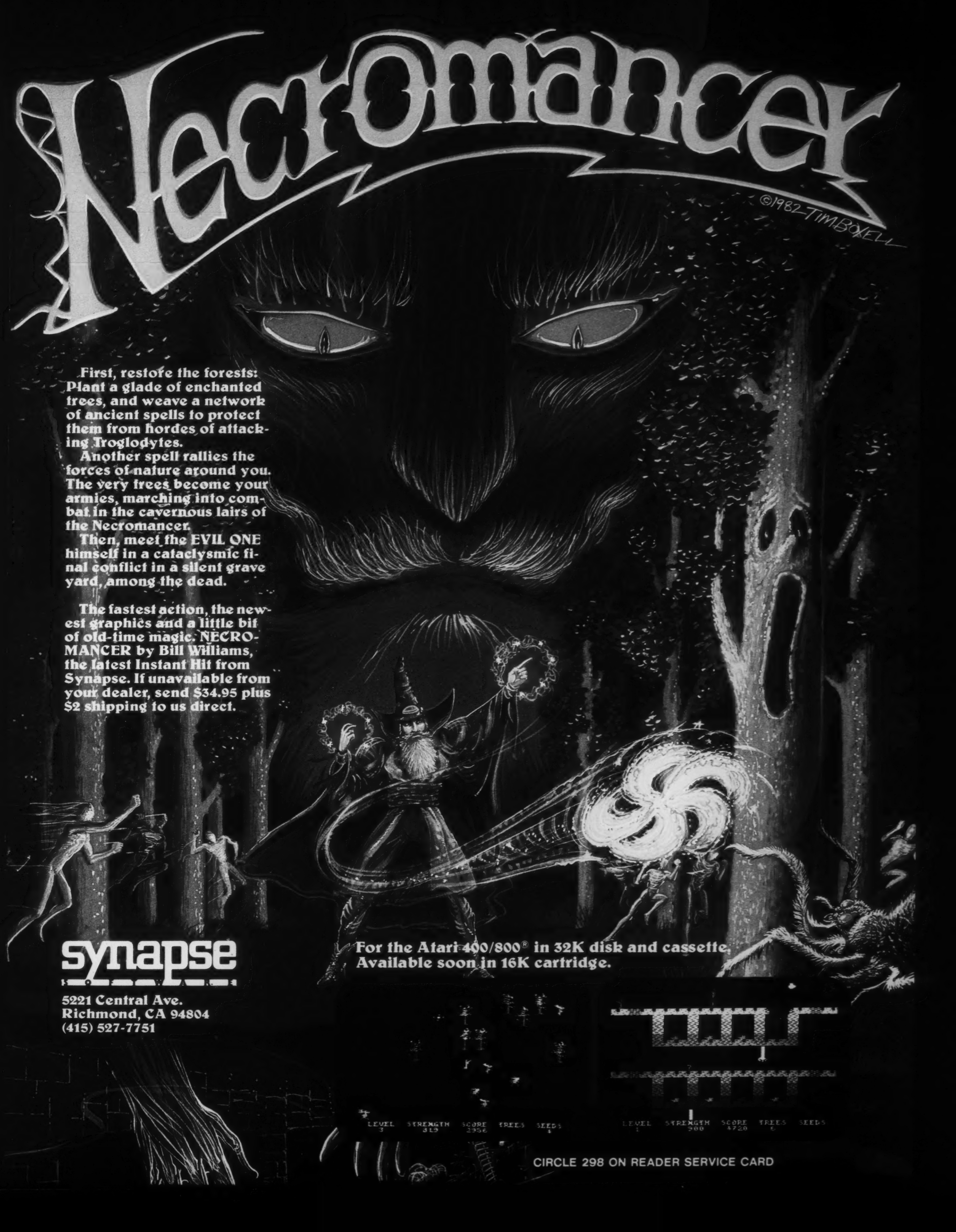
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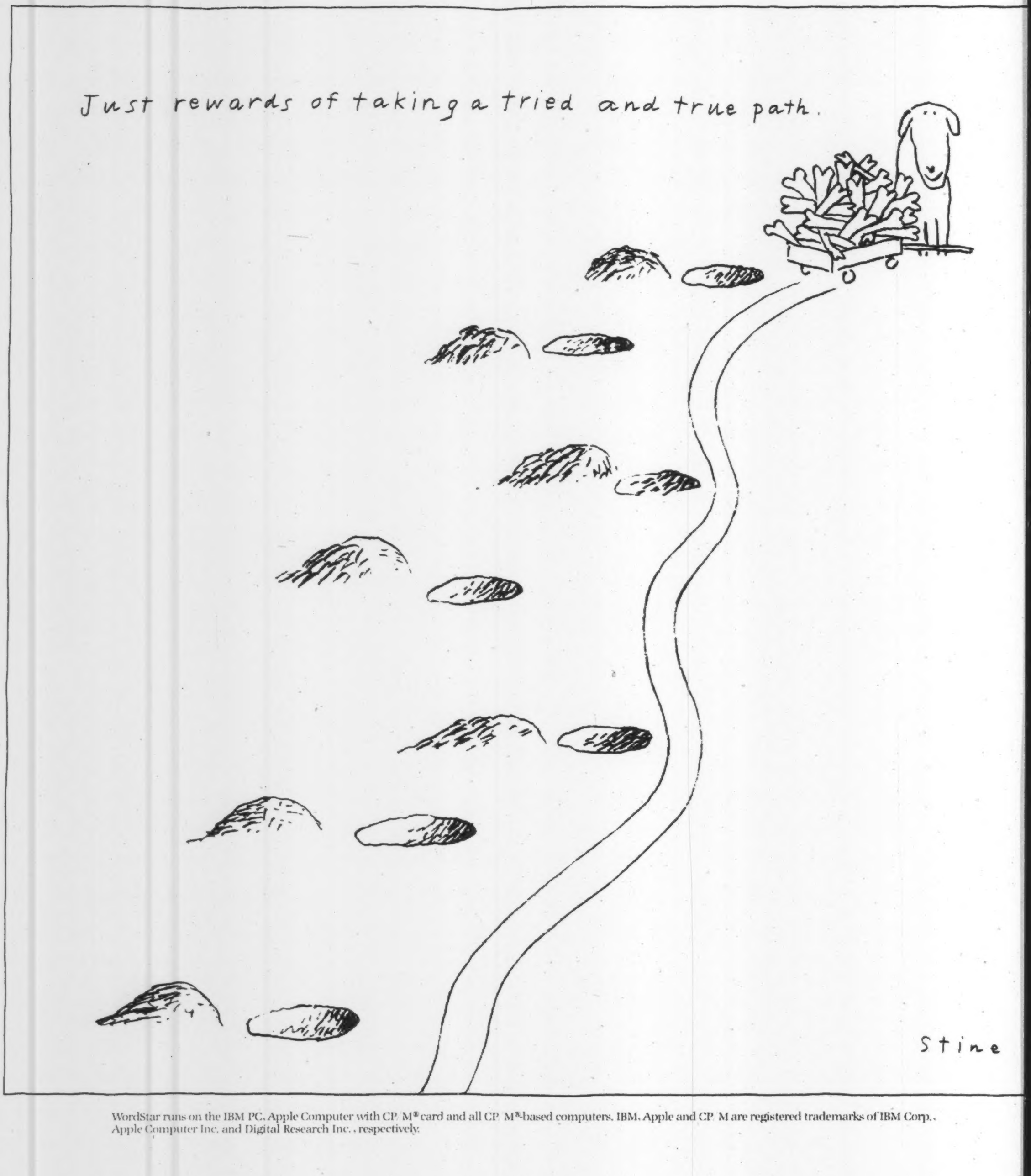
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How to connect serial printers to the Atari 850 interface

A Letter Quality Alternative For Atari Users

Nancy Blumenstalk Mingus

You want letter quality capabilities on your Atari system, but Atari makes only dot matrix printers. So you decide to wait until they produce a letter quality printer instead of fighting with interfacing to non-Atari printers right? Well, you don't really have to wait. By using the Atari 850 interface module you can use any parallel printer or RS-232 serial printer on the market.

But, be forewarned. Interfacing other products to the Atari is not as easy as Atari would lead you to believe. I found this out the hard way. Although Atari does give you all the information necessary to use the interface module properly, you must glean the facts from three different manuals. This article explains some of the problems encountered in interfacing an Anderson Jacobson 832 (RS-232) to the Atari, and offers some solutions that should apply to many other RS-232 printers as well.

One of the first problems faced by any new printer owner is getting a cable to connect the computer to the printer. I was no exception. Although the literature on the 850 says it is standard RS-232, it has only 9-pin connectors. Most printers use 25-pin connectors so you need a cable to convert the signals coming from the 25-pin connector into signals recognized by the 9-pin connector.

Now I am not an electronics expert, so I wouldn't even attempt to create my own cable. Since I use port 1 on the 850 for a modem, I wanted port 2 to be my printer port. With the wiring diagram for port 2 and the wiring diagram for the Anderson Jacobson printer in hand, I located a good electrician and he kindly wired everything correctly for me. If you don't know anyone in your area who does this kind of work, your local Atari dealer should be able to help you.

Once everything is connected properly, there are a few other things you need to remember when using the printer. The most important of these concerns the disk drive. If you plan to use a disk drive with your interface module and printer you must have DOS II as your disk operating system.

There is a special file in DOS IIcalled AUTORUN.SYS which automatically runs when you turn on the computer. This affects the power up sequence you use. You must first turn on the printer, then the disk drive, then the interface module, and finally the computer. Also, be sure you have the Basic ROM pac in place.

Most of the above is explained in the 850 manual, but they make no mention of the AUTORUN.SYS file. The problem I encountered was error number 130 when I tried to open the printer port. This message indicates that the interface module can find no such device. What had happened was that the system disk I had created from the master disk had not copied the AUTORUN.SYS file. Once I copied the file on to the system diskette, I could then open the printer port.

Trying to print or list on the printer is now a fairly simple matter. To print to it, I just type:

```
OPEN #2, 8, 0, "R2:"
```

where:

OPEN	signifies initialization of a device or file.
#2	indicates the channel number being used. It can be any number 1 through 8.
8	means opening the channel for output only, which is all that is required for a printer.
0	this argument is not used, so will always be zero.
"R2:"	refers to the port being used. The 2 signifies port 2.

Any subsequent printing statement takes the following form:

```
PRINT #2; "Anything", variable
```

where:

PRINT	is the standard Basic PRINT command.
#2	is the channel previously defined in an OPEN.

To close the device or file, you enter:

```
CLOSE #2
```

where:

CLOSE	means you are terminating the use of a channel.
#2	is the channel being closed.

Again, this is explained fairly well in the interface module manual. The LIST command however, is somewhat confusing. To LIST to the printer, instead of

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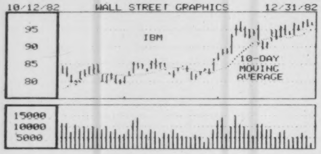

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LIST#2 as you might expect, you must type:

```
LIST "R2"
```

where:

LIST	functions the same as usual.
"R2"	is the port number you are listing through.

Now that you know how to connect your printer, list a program, and print lines to the printer you are almost ready to start. There is however, one last problem. The default configurations of the RS-232 ports as shown in the 850 manual need one modification because the ports do not send a linefeed when they send a carriage return. That is, when the printhead returns to the left margin of the paper, the paper does not roll up one line. So all your lines print on top of each other. To change this, you must reconfigure one aspect of the printer port with which you are working. Again, I use port 2, and the command I use is:

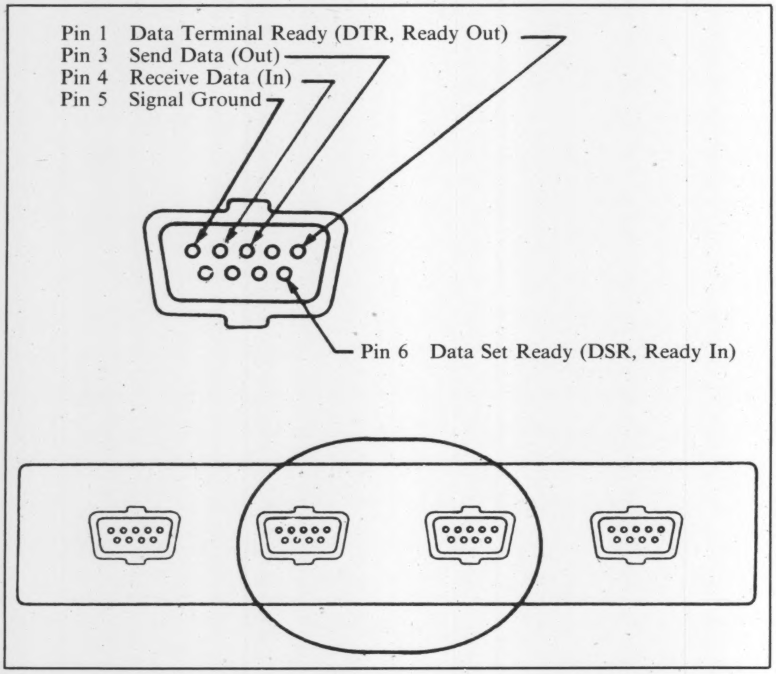
```
XIO 38,#2,64,0,"R2:"
```

where:

XIO	is a special command used to configure various aspects of a port.
38	is the particular XIO command type.
#2	is the channel number being used.
64	is a decimal code meaning turn on linefeed.
0	as in the OPEN command, remains zero.
"R2"	is the printer port.

Before you can do a list, you must enter this command, and to be safe, you should include it in any program you write which requires more than one line to be printed on the printer.

Now you should be in fairly good shape to start using that nice letter quality printer. ☐


Pin 1 Data Terminal Ready (DTR, Ready Out)
Pin 3 Send Data (Out)
Pin 4 Receive Data (In)
Pin 5 Signal Ground
Pin 6 Data Set Ready (DSR, Ready In)

Pin functions of Serial Ports 2 and 3 in the 850 Interface Module (9-pin female connector).

Atari to Anderson Jacobson Wiring Chart.

Pin No. on AJ Connector	Signal Name	Pin No. on Atari Connector	Signal Name
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C	Output	4	Receive
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F	DSR	6	DSR

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THE 8TH WEST COAST

COMPUTER FAIRE

San Francisco March 18-20, 1983

David H. Ahl

"The king is dead. Long live the king." This is the cry that rings out in Britain upon the death of a king and the ascendency to the throne of the next monarch in line. (Of course, other permutations are possible: queen, queen; king, queen; and queen, king.)

This phrase came to mind more than once as I wandered the aisles and talked to exhibitors and attendees at the Eighth West Coast Computer Faire.

Just as *Creative Computing* is the oldest surviving magazine in the personal computing field (Vol. 1, No. 1 was published in November 1974), the Faire is the oldest surviving consumer show in the field. John Dilks's Personal Computing Festival in Atlantic City predated the first West Coast Faire by over 1-1/2 years, but unfortunately John didn't have the staying power (persistence) that Jim Warren has exhibited with the West Coast Faires.

Sure, there were disasters (who can forget the Los Angeles debacle?), but, for the most part, Jim did things right. He kept in close touch with the industry—vital for running a good show. Jim is a computer guy first and a show promoter second. But he is a good promoter and has consistently delivered hordes of quality attendees to a rapidly growing (and changing) industry.

Rumors were flying before and during the show that Jim sold the show to Pat McGovern (IDC, *Computerworld, Infoworld*). In fact, three people told me the deal had been signed, sealed, and delivered.

However, as the show closed on Sunday, I was talking to Jim (on roller skates, as usual) when a call came over his walkie talkie, "Pat McGovern is waiting in your office."

"Tell him to call me tomorrow," was Jim's reply. He went on to explain that his main reason for selling was to give him time to do something with computers again. However, Pat wanted him to stay on as show manager for several years, thus removing a great deal of the impetus for selling out. Hence, Jim was reconsidering. Who knows? By the time you read this everything could have changed around again.

But whether Jim sells or not, the show will continue to evolve. Initially, the Faire was a show for hobbyists, hackers, and fanatics. I'll never forget the first show in the Civic Auditorium. The aisles were so jammed on Saturday that you simply couldn't move. It was not a good place for someone with even a mild case of claustrophobia. People were five deep around the *Creative Computing* booth waving dollar bills for copies of the magazine or *Basic Computer Games*, our only book at the time.

As the market for personal computers

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On set-up day, aisles are clogged with cartons, curtains, and cables.

Photos by David Ahl

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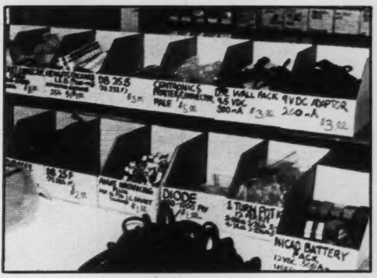
By Saturday afternoon, the Faire was teeming with humanity.

HUNTINGTON
COMPUTING

Fred and Barbara Huntington, two of the nicest people in the software industry, pose in front of their booth.



Hobbyists could find enough connectors, diodes, ICs, and parts to build almost anything.

COMPUTER DISCOUNT PRODUCTS
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MX-80
MX-100

The discount vendors did a good business; by late Sunday, everything was going at a discount.

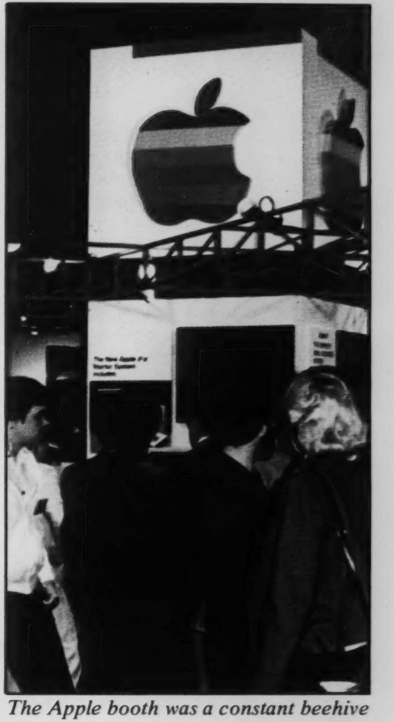
has changed, so has the show. Despite a larger than ever attendance this year (50,000 or so), there was relatively little frantic activity. Most exhibitors went away satisfied, but a bit disappointed. "Too many lookers, not enough buyers," was a frequent comment.

Personally, I think there was just as much buying as at previous Faires, but it was spread across many more vendors. At previous Faires, manufacturers such as Apple, Cromemco, Commodore, and Processor Technology (remember them?) had huge booths to show off their wares, but they did not sell on the show floor. Thus, the vendors who were selling occupied less than half of the floor space.

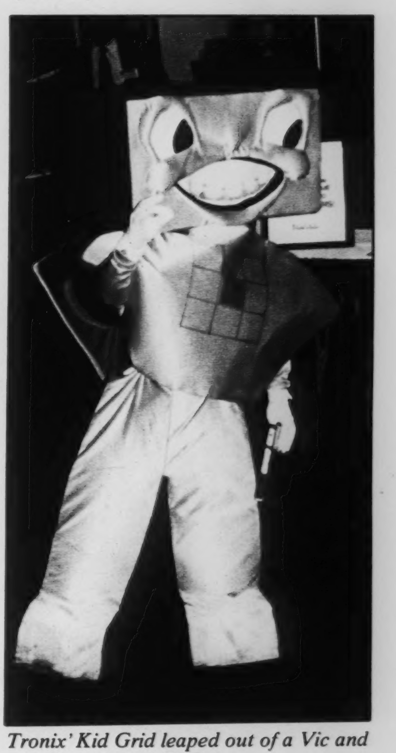
This year, very few primary manufacturers were at the show, and those who were had modest booths. Thus, 90% of a much expanded exhibit space (extending to loading docks and balcony passages) was occupied by vendors with products to sell. As a result of this competition, the sales of each individual vendor were somewhat reduced.

So, perhaps the Faire as it used to be is dead. However, it will continue in a new guise. Long live the Faire.

Speaking of competition, in the area of magazines, seven new ones were introduced at the Faire. Apparently, several publishers see the need for a true home computing magazine; thus you will shortly be seeing *Micro Discovery*, *Digit*, and *Family Computing*. Another Commodore



The Apple booth was a constant beehive of activity.



Tronix' Kid Grid leaped out of a Vic and into the aisles of the Faire.

magazine, another Color Computer magazine, and another Atari magazine are also on the way. And our parent company, Ziff-Davis introduced *PC Tech Journal.*

Of Special Interest

We can't possibly cover all the activities and new products of the 450 some odd exhibitors here, so we've elected to report on some products of special interest. Others will be showing up in our new products section in forthcoming issues.

In a hotel room, Quadram Corp. was previewing a board for the IBM PC that simulates an Apple computer. Everything is on the board—microprocessor, 48K of memory and I/O and display drivers. It uses the keyboard, disk drives, display, and power supply of the PC. Because everything is on the board, when it is installed, the PC can actually do processing of both Apple and IBM programs simultaneously. Since the Apple board does not use the IBM PC memory, data can only be interchanged by writing and reading from disk; software is provided to do this. Price $680.

Three floors up in another hotel room, Osborne was previewing the Osborne Executive. The main external differences between it and the Osborne 1 are that it has a 7" 24-line x 80-character amber display, two compact disk drives mounted in the left side of the housing, a power switch on the front, two serial ports, an IEEE 488 port, and a standard RCA jack for an external monitor. Internally, it has 128K of memory and is able to run synchronous communications software so it can talk to IBM mainframes using 3271 emulation. Also promised is emulation for 3780, 2780, 3741, and several others.

In addition, it will be able to emulate a wide variety of standard terminals—Beehive, Televideo, Hazeltine, etc.

Upon powering up, the machine goes through an extensive self-test. It then allows you to configure it in any way that you wish with five cursor options, reversed display, key click feedback, 50 or 60 Hz power, 15 communications baud rates, logical and physical device protocols, and various character sets. Price $2495.

In about six months Osborne will also introduce the Executive II which will have an 8088 co-processor, an additional 128K of memory independent from the 128K for the Z80, and an IBM PC compatible video graphics system. Osborne expects that over 80 percent of IBM PC software will run on it. No price yet.

Giving Osborne a good run is the Access Computer which is the first portable to include a full-size built-in printer and acoustic modem. The access is a compact 16" x 10" x 10-3/4" and weighs 33 pounds. It has a 7" amber display, two double density disk drives, Z80 mpu, 64K of memory, 80 cps dot matrix printer and both an acoustic coupler and direct-connect modem built in. The keyboard is detachable and has 76 keys including numeric keypad and 15 function keys. In addition to the built-in printer, the Access has a parallel port, IEEE 488 port, and two RS-232C ports.

The manufacturer, Access Matrix Corp., bundles a software library in with the Access including CP/M, M Basic, C Basic, *Fancy Font* (Softcraft), and Perfect Software's integrated programs, *Perfect Writer, Speller, Calc,* and *Filer,* Price $2495.

On the other end of the spectrum, a new low-end entry from Venture Micro Inc., the Humdinger, will provide some strong competition for the Timex Sinclair, Video Technology VZ200, Mattel Aquarius, and TI 99/2. The Humdinger has a Z80 mpu, 4K of memory (expandable to 64K), 8K Basic in ROM, cassette I/O, parallel and serial ports, high resolution video (256 x 192 pixels) in eight colors, 12 graphics display modes, and four sound voices (five-octave range). The keyboard has 58 Chiclet-style rubber keys. A full array of peripherals and software is listed

The Osborne Executive has a 7" screen, two compact disk drives, and improved housing.

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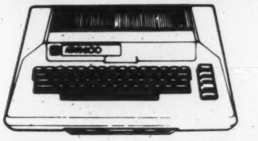

1200 XL . Call
800 48K . $489
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410 Recorder	$ 72
810 Disk Drive	$419
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830 Modem	$145
850 Interface	$159
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CIRCLE 149 ON READER SERVICE CARD

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dBase II (MS Dos)	$419
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Computer Software Technology	
Word/PC	$ 49
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Datamost	
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PC Tutor	$ 55
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Executive Accounting System (128K)	$469
Eagle Software	
Money Decisions	$129
Howard Software	
Real Estate Analyzer II	$159
Tax Preparer 1983	$159
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25:01	$ 65
Innovative Software	
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IUS	
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The Tax Manager	$159
Micro Pro	
Wordstar	$299
Mailmerge	$ 159
Spellstar	$109
Infostar	$299
Reportstar	$ 209
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Answer	$159
PBL Corporation	
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General Ledger	$329
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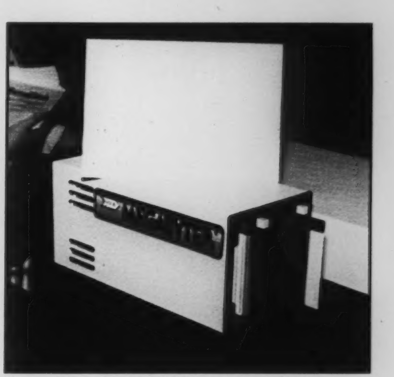
CIRCLE 226 ON READER SERVICE CARD

The Attache from Otrona Advanced Systems boasts bit mapped graphics, 7" screen, and a very compact design.



Megaflex dual 3" drive stores 0.5 megabytes for $1490.

Howard Nurse, in the flesh, and via Commsoft's PhotoCaster system.

on the flyer and price list although we saw only the basic computer. Watch these pages for a complete review. Price $129.95.

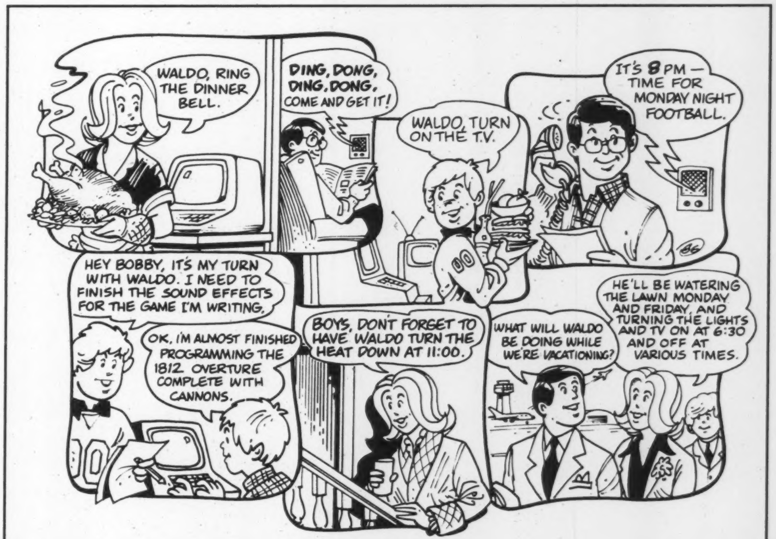
Megabyter was showing a universal disk controller for the Apple along with four drives. The universal controller runs standard Apple DOS, as well as CP/M, Pascal, SOS, and Apple III DOS emulation. The 5" dual drive is double density, and stores a whopping 2.4 megabytes per drive. A 3-1/2" Sony-type micro drive stores 560K per unit while an 8" drive allows the use of 8" disks from other systems.

Artra, Inc. introduced Waldo, one of the most fascinating devices at the Faire. Waldo is a board that plugs into an Apple and is a combination of voice recognition circuitry, real-time clock, home-control hardware, and sound and speech synthesizer. In effect, Waldo borrows your computer's "brain" and gives it hearing, speech, and the ability to control the world around it. We'll have a full review of Waldo coming up soon but, the cartoon below will give you some idea of its capabilities. Price $599.

PhotoCaster from Commsoft, Inc. is another nifty device for the Apple. Howard Nurse showed us how it could capture and display an image from a TV camera (b & w or color), send and receive an image over telephone lines in eight seconds using the dithering process developed at Bell Labs, enhance the image using a joystick for entry, and print an image on a dot matrix printer such as the Epson MX-80. Images have a resolution of 128 x 128 pixels with each pixel having 16 gray levels. Color photos are composed of one frame for each of the red, green, and blue primary color images.

Two speech synthesis boards were introduced for the Apple, the SSB from Multitech Electronics and the Mockingboard from Sweet Micro Systems. Both have remarkable speech, although with somewhat different characteristics. The SSB uses the Texas Instruments TMS5220 speech chip, has an on-board amplifier, and a 1200-word digitized dictionary on a floppy disk. It sounds like Speak 'N' Spell. Price $195.

The Mockingboard comes in four flavors—sound effects only ($99), sound in stereo ($199), speech only ($149), and sound effects/speech combination ($299). Sound effects are produced with the General Instruments PSG which can produce the sounds of cannon fire, trains, weapons, and unearthly musical notes. Speech is produced with the Votrax SC-01, a phoneme type of chip with 64 phonic building blocks that can be combined to create any words you wish. It has the familiar Votrax Swedish accent.


WALDO, RING THE DINNER BELL.
DING, DONG, DING, DONG, COME AND GET IT!
WALDO, TURN ON THE T.V.
IT'S 8 PM — TIME FOR MONDAY NIGHT FOOTBALL.
HEY BOBBY, IT'S MY TURN WITH WALDO. I NEED TO FINISH THE SOUND EFFECTS FOR THE GAME I'M WRITING.
OK, I'M ALMOST FINISHED PROGRAMMING THE 1812 OVERTURE COMPLETE WITH CANNONS.
BOYS, DON'T FORGET TO HAVE WALDO TURN THE HEAT DOWN AT 11:00.
WHAT WILL WALDO BE DOING WHILE WE'RE VACATIONING?
HE'LL BE WATERING THE LAWN MONDAY AND FRIDAY, AND TURNING THE LIGHTS AND TV ON AT 6:30 AND OFF AT VARIOUS TIMES.

AIS American Bell
Advanced Information Systems

American Bell had a mini-booth in an out-of-the-way downstairs corridor. The photo makes it look far better than it was.

With the growing interest in the use of remote information services, community bulletin boards, and the like, several manufacturers were showing inexpensive modems. Typical was the Eagle DC-2 direct-connect modem from Wilkison Engineering. It operates only at 300 baud and offers full and half duplex operation in one of two modes: originate/answer (Bell 103) or auto answer. A bargain at $99.

There were hundreds of new games and game controllers for every imaginable computer. Kraft was showing an Atari-compatible joystick with a short throw and very fast action. Similar to their Apple joysticks, this is the first Atari stick designed for fingertip control.

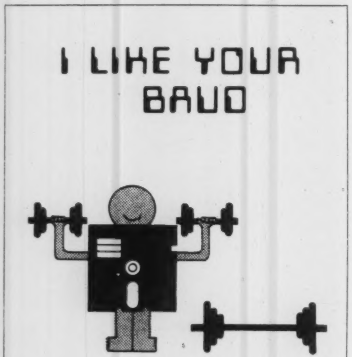
Interfirm Systems had a track ball designed mainly to be a high-precision input device to replace CRT touch membranes, light pens, digital mice, optical mice, and joysticks. The product, Digit-Ball, is an optical track ball which produces 256 pulses per revolution of the ball. At $99 it is a bit pricey for game control but if you can justify the cost for other uses, it sure will provide amazing control. Versions available for Apple, IBM, and Commodore 64.

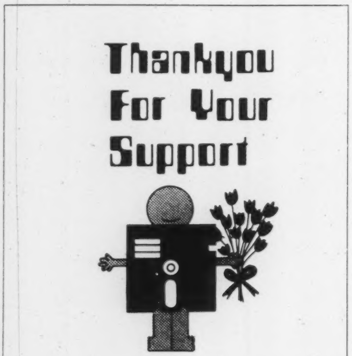
Perhaps the strangest controller of all was being shown by Exersoft Corp. The Foot-Craz is a foam pad that functions like an Atari joystick when one of the five colored dots is stepped on. Included with Foot-Craz is a jogging game (actually it is just jogging indoors), and Stomp, a game in which you stamp out colored bugs.

Sirius, Broderbund, Sierra On-Line, Datamost, Penguin, Datasoft, Adventure International and scores of others were showing new games. We'll review the best on these pages. However, let me mention briefly a new Synapse game, *Survivor.* This is billed as the first cooperative computer game (for up to four players). *Survivor* pits a navigator, propulsion engineer, and two gunners against a fleet of attacking ships and four heavily-armed space fortresses. It is amazing how one's playing style and strategy change when one has to communicate with others to win the game. Available for Atari ($34.95); coming soon for Commodore 64, Vic-20, and TI 99/4A.

Mary Griesinger of Adventure International shows off her neat racks before the show opened.

If your friends don't already know that you are a computer enthusiast, you might want to start sending computer greeting cards from Computer Greeting. A line of 24 disk-shaped cards is available for all occasions: birthdays, friendship, get well, new baby, etc.





Manufacturers and Reader Service

Below are the names and addresses of manufacturers mentioned above. For more information on any of the products mentioned, just circle the reader service number or write to the manufacturer directly (please mention *Creative Computing).*

Reader Service	Company
413	Quadram Corp. 4357 Park Dr. Norcross, GA 30093
414	Osborne Computer Corp. 26538 Danti Ct. Hayward, CA 94545
415	Access Matrix Corp. 2159 Bering Dr. San Jose, CA 95131
416	Venture Micro, Inc. 10090 N. Blaney Ave. Cupertino, CA 95014
417	Megabyter 11722 Sorrento Valley Rd. San Diego, CA
418	Artra, Inc. P.O. Box 653 Arlington, VA 22216
419	Commsoft, Inc. 2452 Embarcadero Way Palo Alto, CA 94303
420	Multitech Electronics 195 West El Camino Real Sunnyvale, CA 94086
421	Sweet Micro Systems 150 Chestnut St. Providence, RI 02903
422	Wilkison Engr. Ent. P.O. Box 721 Cloverdale, CA 95425
423	Kraft Systems Co. 450 W. California Ave. Vista, CA 92083
424	Interfirm Systems Corp. 1899 Montford Ct. San Jose, CA 95132
425	Synapse 5221 Central Ave. Richmond, CA 94804
426	Exersoft Corp. 333 Escuela Ave. Mountain View, CA 94040
427	Computer Greetings 2661 Lakeview Dr. San Leandro, CA 94577

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CIRCLE 313 ON READER SERVICE CARD

Adding Lowercase To Apple Writer

Randi J. Rost

As part of the ongoing series of articles in the magazine dealing with modifications to *Apple Writer,* I offer the following patch.

I don't have a lower case adapter, but still wanted to send printer control codes to my Epson MX-80 printer. The patch to the PRINTER program of the *Apple Writer* package in Listing 1 lets you send such codes to your Epson MX-80 with Graftrax if you don't have a lower case adapter and haven't made any of the previous modifications to PRINTER or TEDITOR.

The jump at $12D8 lets us jump to the modified character conversion routine at $18E0. The first three compare check for escape, underscore, and master space (@) characters respectively. The fourth compares checks for a $26 (&) which is

Listing 1.

```
BLOAD PRINTER

CALL -151

12D8:4C E0 18     (JMP $18E0)

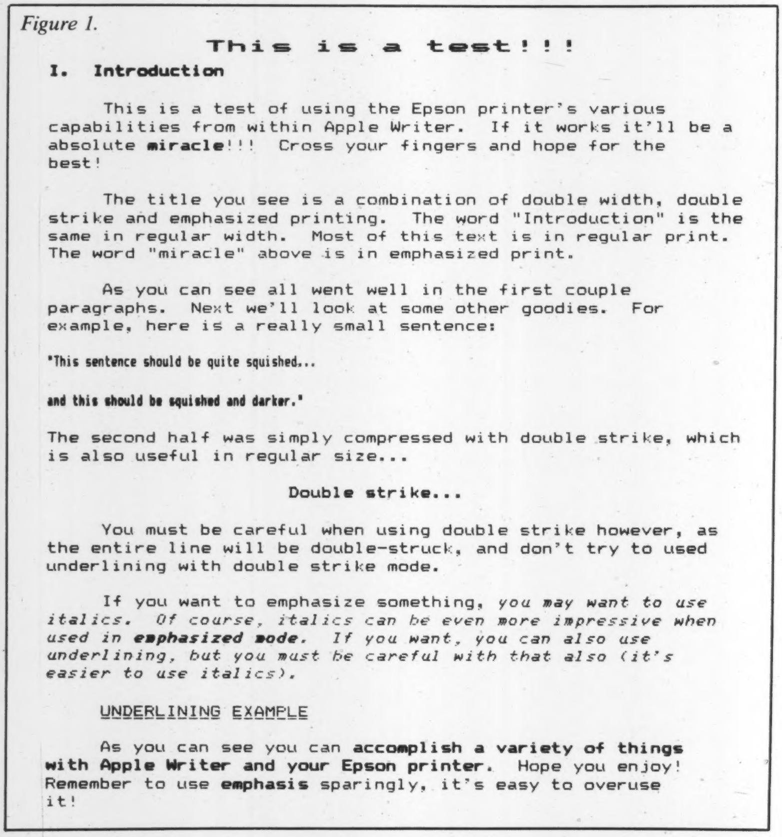
18E0:C9 1B        (CMP #$1B)
18E2:F0 0E        (BEQ $18F2)
18E4:C9 5F        (CMP #$5F)
18E6:F0 0A        (BEQ $18F2)
18E8:C9 40        (CMP #$40)
18EA:F0 06        (BEQ $18F2)
18EC:C9 26        (CMP #$26)
18EE:D0 05        (BNE $18F5)
18F0:A9 08        (LDA #$08)
18F2:4C FB 12     (JMP $12FB)
18F5:48           (PHA)
18F6:09 C0        (ORA #$C0)
18F8:4C E3 12     (JMP $12E3)

3D0G

BSAVE PRINTER,A$803,L$10FC
```

Randi J. Rost, 1405 Woodland Ave., Fairmont, MN 56031.

Figure 1.



This is a test!!!

I. Introduction

This is a test of using the Epson printer's various capabilities from within Apple Writer. If it works it'll be a absolute **miracle**!!! Cross your fingers and hope for the best!

The title you see is a combination of double width, double strike and emphasized printing. The word "Introduction" is the same in regular width. Most of this text is in regular print. The word "miracle" above is in emphasized print.

As you can see all went well in the first couple paragraphs. Next we'll look at some other goodies. For example, here is a really small sentence:

"This sentence should be quite squished...

and this should be squished and darker."

The second half was simply compressed with double strike, which is also useful in regular size...

Double strike...

You must be careful when using double strike however, as the entire line will be double-struck, and don't try to used underlining with double strike mode.

If you want to emphasize something, *you may want to use italics. Of course, italics can be even more impressive when used in* ***emphasized mode.*** *If you want, you can also use underlining, but you must be careful with that also (it's easier to use italics).*

UNDERLINING EXAMPLE

As you can see you can **accomplish a variety of things with Apple Writer and your Epson printer.** Hope you enjoy! Remember to use **emphasis** sparingly, it's easy to overuse it!

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SAKATA SC-100
COMPATIBILITY CHART

COMPUTER	SC-100 COLOR
APPLE II	✓
APPLE III	
ATARI-800	✓
COMMODORE-64	✓
IBM-PC	✓
NEC-PC	✓
OSBORNE	✓
TI-99	✓
VIC-20	

NOTE: ON CERTAIN COMPUTERS ADAPTER CABLE REQUIRED.

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Apple / Lowercase, continued...

used to represent a backspace. If a $26 is found, we load the accumulator with $08, the true value for a backspace character. If any of these four is found, we jump back to the main routine, skipping over the part that sets the high bit of every character sent to the printer. If none of the four is found, we execute the character conversion routine as if nothing happened.

The reason we use a $26 to represent a backspace and then change it to a true backspace just before printing is simple. A true backspace ($08) appears on the screen as an inverse H. Since this is also the way a capital H is maintained by *Apple Writer,* this will cause a conflict. Selecting some seldom used symbol to represent a backspace and then converting just before printing resolves this conflict.

The printer control codes can then be incorporated as suggested on page 142 of the June 1982 issue of *Creative Computing.* Create a file with escapes (hex code = $1B), underscores ($5F), backspaces ($26) and master spaces ($40). Then use this file to create files to turn the various characteristics on and off (e.g., ESC E to turn on emphasized print, etc.) These can then be inserted via CTRL-I anywhere in your text. Some comments about this modification:

1. To turn off double strike or compressed modes, use the reset printer code (ESC @). This will return all printer characteristics to standard settings.
2. Using compressed and expanded type styles can spoil a line of printout unless the entire line is printed in that mode. *Apple Writer* counts characters to determine line length, and one line of regular size letters is about two lines if printed double-width and half a line if printed in compressed mode.
3. I was unable to use compressed and emphasized modes simultaneously. Use compressed and double strike to give essentially the same results.
4. Use the reset printer code (ESC @) on a line by itself when you use it. I had problems with left margin alignment when including it in the same line as other text.
5. Underlining can be accomplished by inserting the appropriate number of backspaces, and then the appropriate number of underscore characters. The Epson *does* respond to the backspace character, but *Apple Writer* counts all characters, so you may want to increase line length to insure that everything will be printed on one line. Underlining may enhance column titles, but italics are easier to use within the text (if you have Graftrax 80, that is.)

There you have it. I hope this lets you make better use of your *Apple Writer* and Epson printer. ☐

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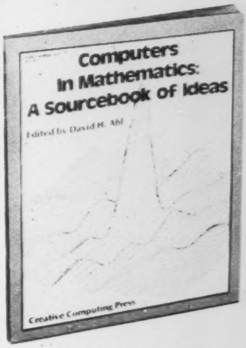

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Printer Control From Apple Writer

Charles L. Hearn

When I began investigating text editors for my Apple II, I found that there was no single program that was ideal for my needs. My final choice was the *Apple Writer Text Editing System* marketed by Apple Conputer, Inc. This system is simple to use, performs the most common word processing functions, and is relatively inexpensive.

Perhaps most important in my case, however, is the fact that *Apple Writer* is supplied on a disk that is not copy protected. This means that not only can backup copies easily be made, but the program can be modified to provide features not in the original program. Indeed, several articles have appeared in *Creative Computing* describing modifications to *Apple Writer*.

One feature not provided by *Apple Writer* is the ability to send special control characters to the printer or printer interface. My printer, an IDS 460 Paper Tiger, uses control characters to change the number of characters per inch and to change from normal to expanded type. This provides the ability to emphasize portions of the text such as headings.

Since I use this feature frequently, I decided to modify *Apple Writer* to send any ASCII character to the printer. This article describes how you can make this modification to your *Apple Writer.*

Apple Writer consists of two machine language programs: TEDITOR and PRINTER. The TEDITOR program allows entry and editing of text. The PRINTER program formats and prints the text; this is the program that must be modified to send printer control characters.

I began by disassembling the PRINTER program using the Apple disassembler (monitor L command). I was greatly assisted in understanding the operation of the program (at least the part that needed modification) by John E. Stith's excellent article in *Creative Computing* ("Lower-Case Display for Apple Writer," February 1981, page 124). The key to the modification is a JMP instruction at location $0F59 in the PRINTER program.

Apple Writer uses special commands embedded in the text to change the format of a page while it is being printed. A format command is signalled by an ! in the first column of a new line. The JMP instruction at $0F59 branches to a routine which processes the formatting commands.

All that was necessary was to change this instruction to branch to a new routine located at the end of the original program. This new routine intercepts all text-embedded format commands. If the command is for printer control, it is deciphered and the proper ASCII character is output. If the command is not for printer control the program branches to the original processing routine.

The new text-embedded printer command has the form:

!as(number)

where (number) stands for the decimal ASCII code of the character that is to be output. Any ASCII character can be output. Normally, this feature would be used only to output single characters or character sequences that are intercepted by the printer interface or the printer. For example, to output a control-A, the command is

!as1

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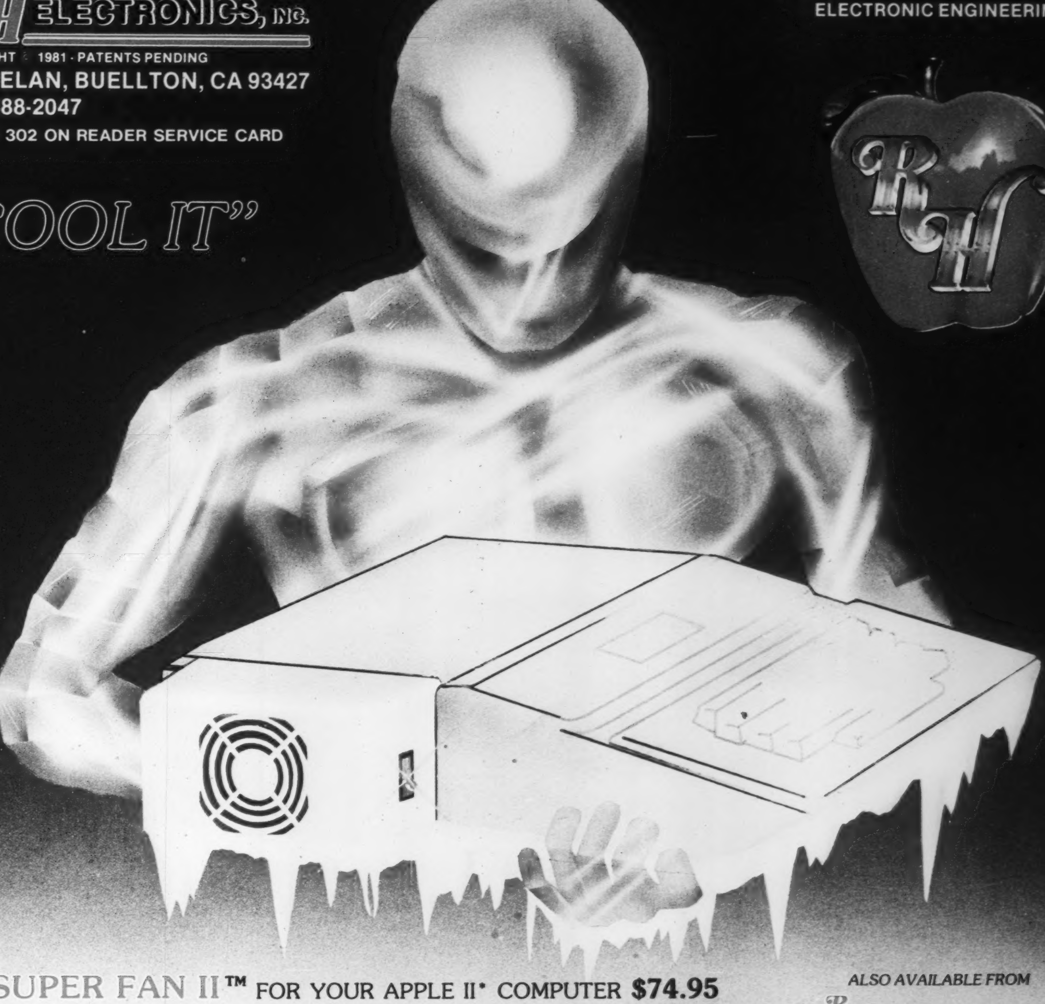

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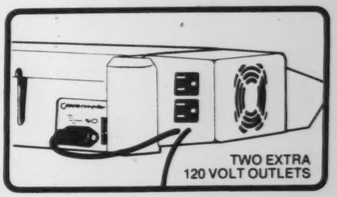

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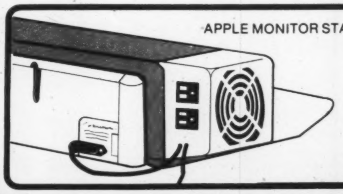

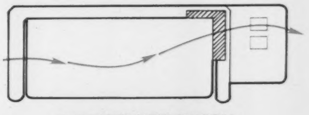

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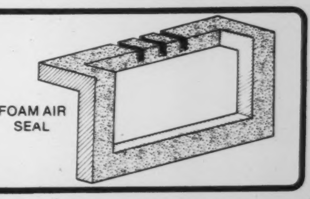

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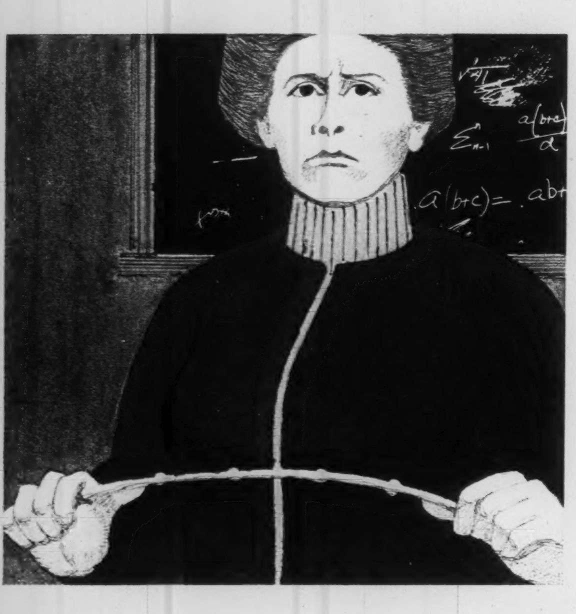

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The number 1 is the decimal ASCII code for control-A. As another example, to output the sequence (CTRL-I)80N (used by some printer interfaces to set the number of output columns to 80) the sequence of commands is

!as9
!as56
!as48
!as78

Here 9 is the ASCII code for control-I, 56 is the code for 8, etc.

This command format is the same format used for the other *Apple Writer* text-embedded commands. As with the original commands, this new command must be preceded and followed by a RETURN, i.e., it must appear on a line by itself and must be the first characters on the line.

This means that you cannot change the character density in the middle of a line to emphasize a single word or phrase. In general this is not desirable, however, since changing the character density also changes the number of characters per inch. The resulting shift in margin locations is easy to compensate for in headings or individual paragraphs, but difficult when the change occurs in the middle of a line.

Listing 1 contains the modifications that must be made to PRINTER to include this feature. The modifications consist of changing the JMP instructions at $0F59 to branch to the new routine, which begins at $1865, and adding the new routine to the end of the program. Listing 2 is a disassembled listing of the new routine. The modifications are made as follows:

1. Use a copy program to make a copy of your *Apple Writer* disk. Do not modify the original disk! Make the modifications on the copy.
2. Boot a DOS master disk, and insert the *Apple Writer* copy in drive 1.
3. BLOAD PRINTER, then enter the monitor with CALL -151.
4. Enter the modifications as shown in Listing 1.
5. Enter $0F59L. The first line of the listing should be JMP $1865.
6. Enter $1865LL and compare the listing with Listing 2.
7. If steps 5 and 6 don't check, go back to step 3.
8. UNLOCK PRINTER
9. BSAVE PRINTER,A2051,L4250
10. LOCK PRINTER

Listing 1. Patches to Apple Writer PRINTER Program.

```
*F5A:65 18
*1865:A0 01 B1 14 C9 C1 F0 03
*186D:4C 45 15 C8 B1 14 C9 D3
*1875:F0 03 4C CE 15 C8 B1 14
*187D:99 00 02 C9 8D F0 05 C9
*1885:60 D0 F2 88 84 0A 20 04
*188D:13 20 D5 15 A5 00 20 ED
*1895:FD 4C 37 0F
```

Listing 2. Printer Control Routine.

```
1865-   A0 01       LDY   #$01
1867-   B1 14       LDA   ($14),Y
1869-   C9 C1       CMP   #$C1
186B-   F0 03       BEQ   $1870
186D-   4C 45 15    JMP   $1545
1870-   C8          INY
1871-   B1 14       LDA   ($14),Y
1873-   C9 D3       CMP   #$D3
1875-   F0 03       BEQ   $187A
1877-   4C CE 15    JMP   $15CE
187A-   C8          INY
187B-   B1 14       LDA   ($14),Y
187D-   99 00 02    STA   $0200,Y
1880-   C9 8D       CMP   #$8D
1882-   F0 05       BEQ   $1889
1884-   C9 60       CMP   #$60
1886-   D0 F2       BNE   $187A
1888-   88          DEY
1889-   84 0A       STY   $0A
188B-   20 04 13    JSR   $1304
188E-   20 D5 15    JSR   $15D5
1891-   A5 00       LDA   $00
1893-   20 ED FD    JSR   $FDED
1898-   4C 37 0F    JMP   $0F37
```

I have not attempted to decipher the entire PRINTER program and cannot guarantee that the portion of memory that contains this patch will never be overwritten, or that the routine will not fail under some circumstances. However, I have been using it for some time and have had no problems. Let me emphasize again that the patches should be made to a copy and not to the original *Apple Writer* disk.

If you have made previous modifications to the PRINTER program, such as those necessary to display lowercase text using an adapter, you should be careful that the modifications do not use the same memory as those of Listing 2. This would require relocation of one of the routines.

I have installed a Videx Keyboard and Display Enhancer on my Apple; this allows both lowercase display on the monitor and use of the shift key for upper- and lowercase. Videx supplies patches for *Apple Writer* for use with the Keyboard Enhancer. The routine presented here does not interfere with these patches.

There is one additional caution in installing this modification. *Apple Writer* does not store text in normal ASCII representation. At least one published *Apple Writer* modification, that of John E. Stith mentioned previously, converts the stored text to normal ASCII with the most significant bit set on. If you have installed Mr. Stith's modifications, you will need to change byte $186A of my routine from $C1 to $E1 (ASCII for a) and byte $1874 from $D3 to $F3 (ASCII for s). □

Apple Writer on the Franklin Ace

Melvin Fitting

Recently a computer called the Franklin Ace 1000 appeared on the market. It is intended to be both hardware and software compatible with the Apple II. It lacks the ability to do color graphics but, on the other hand, it is much better suited to word processing than the Apple. There are several features that contribute to this.

First, the keyboard is essentially that of a standard typewriter, with keys for all the special characters (including brackets and braces) in handy locations. Also there is a numeric keypad. But the best feature of the keyboard, in contrast to that of the Apple II, is that it has a fully functional shift key. Going along with this is the ability to generate both upper- and lowercase characters on the monitor. Lowercase adapters are not necessary.

Apple Writer is a very popular word processor for the Apple II, and it works just as well on the Franklin. But, as written, it makes no use of either the ability to generate lowercase characters, or the shift key, since neither are available on the Apple. Supplied with the Franklin are instructions on how to modify *Apple Writer* so that it can use both features. But, for reasons to be described in a moment, this is not the best solution to the problem.

Apple Writer was designed to work on a machine that does not generate lowercase characters. Therefore, it displays normal capitals to represent lowercase, and inverse capitals to represent true capitals. Among other things, this means that you cannot embed control characters in an *Apple Writer* text, since the ASCII codes for them are in use as screen codes for inverse capitals. (See the chart of ASCII Screen Characters on page 15 of the Apple II Reference Manual.)

But there are good reasons for wanting to embed control characters in text—for instance, to send instructions to a printer. Several recent articles discuss this: "Printer Control Codes From Within Apple Writer" by J. Michael Riley, *Creative Computing,* June 1982, p. 142; and "Underlining for Apple Writer" by John E. Stith, *Creative Computing*, June 1982, pp. 146-152. It is also useful to have your text stored in standard ASCII if you are going to communicate with other computers.

The modifications to *Apple Writer* supplied with the Franklin Ace produce a version that makes use of the shift key and displays lowercase characters on the monitor, as promised. But, apparently in order to preserve compatibility with standard Apple software, the files thus created are the same as those created by the original *Apple Writer*, i.e., not in ASCII, and with control character codes unavailable since they are still used to represent capitals.

In "Lowercase Display for Apple Writer" by John E. Stith, (*Creative Computing*, February 1981, pp. 124-129), a modification to *Apple Writer* is presented that allows it to make use of a Dan Paymar lowercase adapter on an Apple. But more than that, if the modification is made, the revised *Apple Writer* produces standard ASCII files, and thus the codes for control characters are free to be used for other purposes. Indeed, both of the articles mentioned above assume that this modification has already been made to *Apple Writer.*

Now, as it happens, it is simple to modify Stith's version further so that it will work on the Franklin. In fact, only one change is necessary. When done, you have a version of *Apple Writer* that will use the shift key feature of the Franklin, and produce standard ASCII files.

All that is necessary is to bypass that part of Stith's routine that converts ASCII codes for capitals to ASCII codes for lowercase unless ESC has been entered first (The *Apple Writer* solution to the shift key problem on the Apple is to use the ESC key instead). More precisely, one merely changes line 18D5 to RTS in Stith's routine, given in Figure 1 in his article.

Thus, finally, it comes down to this. To

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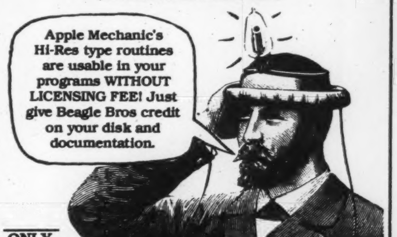
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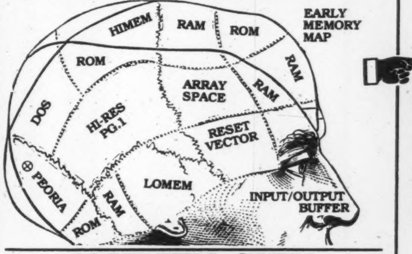

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CIRCLE 121 ON READER SERVICE CARD

get a version of Stith's *Apple Writer* suitable for the Franklin Ace 100 do this.

- Follow the instructions given in Stith's 1981 article for modifying *Apple Writer* but
- Before finishing step 6 of Stith's instructions (in his Figure 5) in which TEDITOR is modified, enter

```
18D5:60
```

That's all there is to it.

The modified *Apple Writer* will, of course, create files that are incompatible with the original *Apple Writer*, and conversely. So I conclude with two simple programs to convert between the two. The programs are written in Basic and are not fast. I have had only very occasional need for them. An assembly language version would be simple to produce if such conversions are needed frequently.

Both programs are used as follows. Make sure the program to convert *to* a particular version of *Apple Writer* is on the same disk as that version of *Apple Writer* (or at least, the TEDITOR for that version). Use *Apple Writer* to load the file to be converted. Exit *Apple Writer* and RUN the CONVERT program. When it finishes its work, it will reload *Apple Writer*, and you can then use it to save the converted file. ☐

Listing 1.

```
5  REM  CONVERTS STANDARD APPLEWRITER FILES TO STITH'S VERSION
8  HOME
10 N = 6400
20 N = N + 1
30 K =  PEEK (N)
40 C = K
50  IF K <  = 30 THEN C = C + 192
60  IF K >  = 193 AND K <  = 222 THEN C = C + 32
70  IF K >  = 224 AND K <  = 255 THEN C = C - 64
80  IF K = 96 THEN  GOTO 110
90  POKE N,C
100  GOTO 20
110  PRINT  CHR$ (7): REM  CTRL-G
120 D$ =  CHR$ (4): REM  CTRL-D
130  PRINT D$;" BRUN TEDITOR"
```

Listing 2.

```
5  REM  CONVERTS STITH'S APPLEWRITER FILES TO STANDARD VERSION
8  HOME
10 N = 6400
20 N = N + 1
30 K =  PEEK (N)
40 C = K
50  IF K >  = 192 AND K <  = 222 THEN C = C - 192
60  IF K >  = 225 AND K <  = 254 THEN C = C - 32
70  IF K >  = 160 AND K <  = 191 THEN C = C + 64
80  IF K = 96 THEN  GOTO 110
90  POKE N,C
100  GOTO 20
110  PRINT  CHR$ (7): REM  CTRL-G
120 D$ =  CHR$ (4): REM  CTRL-D
130  PRINT D$;" BRUN TEDITOR"
```

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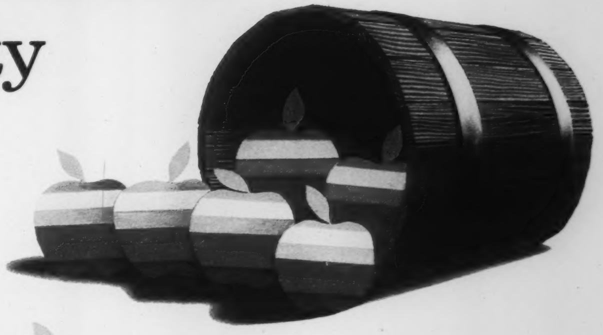

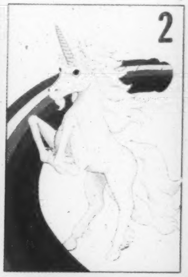

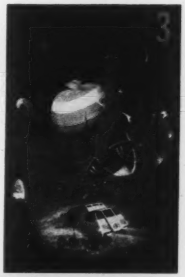

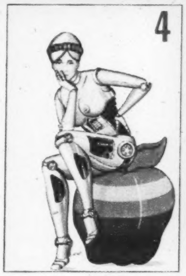

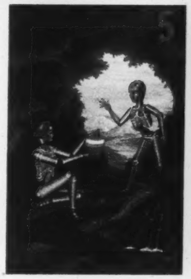

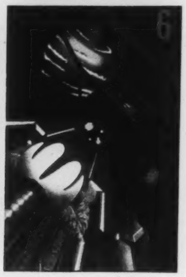

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Word Processing, Type Size, And The Line Printer VI

Ted Byrne

Scripsit is a curious devil. Radio Shack has several nifty printers capable of all sorts of graphic tricks, but you can't make them work from inside their own word processor. The problem has been attacked by the Acorn folks, among others, with augmentation packages like *SuperScript*.

Richard Wilkes has written a clever program that offers features such as underline and boldface. The problem is, I own a terrific printer, the Radio Shack Line Printer VI, and it won't do those things. It prints a whole array of graphics characters, but while these are handy in many Basic programs, they are rarely useful in word processing. Pitch and font changes are what I want.

Pitch controls the space between your lines and the font determines the size and shape of the printed letters. The LP-VI is a real workhorse: it has an adjustable and detachable tractor feed, a friction drive (for single sheet printing), an out of paper alert, and the ability to accept paper from $2\frac{1}{2}''$ to $15''$ wide. It is a substantial, big time printer with many features, including a bi-directional printhead that I have clocked at over 100 cps and about 35 lines per minute. Its size dampens its noise and reduces vibration (especially compared to the din of a daisywheel).

Yes, I like the thing, and it has put in over a year of service with no problems save one: there have been many times when I have wanted to use its ability to print different sized type and spacing but had to resign myself to the fact that *Scripsit* wouldn't let that happen. Then it occurred to me—after all that time—that I was wrong.

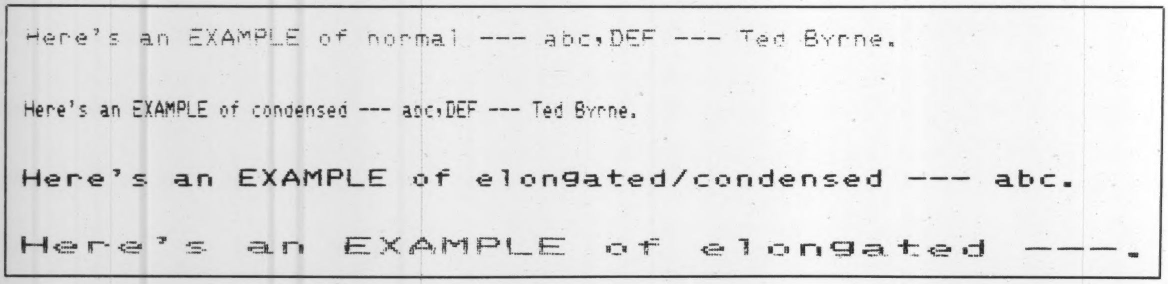
Let's back up a little. The LP-VI offers four different fonts (see Figure 1) and three different pitches (Figure 2). Yet *Scripsit* offers no commands to call up these different modes. What I had forgotten was that the printer can be locked into any combination of these pitches and fonts *before Scripsit is entered*.

The combinations are software directed, so I simply wrote a small start-up program that I enter before *Scripsit*. I then choose my graphic modes and call up *Scripsit* knowing that the printer commands will hold until cancelled.

The LP-VI is normally set at six lines per inch with 132 characters per line. But with this program I can now choose between normal, compressed, com-

Ted Byrne, 45 Woodbridge Terrace, South Hadley, MA 01075.

Figure 1.



Here's an EXAMPLE of normal --- abc,DEF --- Ted Byrne.

Here's an EXAMPLE of condensed --- abc,DEF --- Ted Byrne.

Here's an EXAMPLE of elongated/condensed --- abc.

Here's an EXAMPLE of elongated ---.

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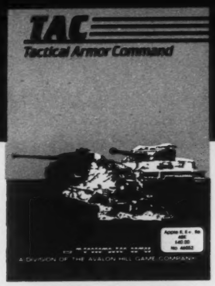

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S.C.I.M.M.A.R.'s—Surface Contra-Gravity Individual Manned Mobile Anti-Vehicle Raiders . . . S.C.I.M.M.A.R.'s is gladiatorial armor combat in the far future. Heroes drive personal combat vehicles more akin to modern jets than tanks, with immense speed and acceleration. It is combat of maneuver, reflex and quick thought where only the best survive. For use with Apple II computer systems with 48K and disk drive, $30.00.

T.A.C.—This is Tactical Armor Command by Ralph Bosson, Avalon Hill's Microcomputer Game of Armored Combat during World War II. You control individual tanks, anti-tank guns, and infantry squads in tactical combat situations. Official armor statistics are utilized. For one or two players featuring outstanding hi-resolution graphics, enhanced sound, and stimulating challenge. Five different scenarios are available from Meeting Engagement, Rear Guard, and Static Defense, to Breakout and Stalemate! The player(s) control up to eight vehicles, guns and squads simultaneously, utilizing the equipment of either the German, British, Russian or American forces. A microcomputer simulation for the most demanding gamers. For the Apple II computer systems with 48K and disk drive. Atari 800/1200, IBM P.C., and Commodore 64 versions available later this fall. $40.00

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TELENGARD—Another not so mighty adventurer bites the dust! Hailed in the February 1983 issue of *Playboy*, "TELENGARD is one of the most powerful examples of the challenging diversions your computer can offer these days." Telengard is a 50-level dungeon exploration game featuring sprite graphics and sound for your Commodore 64. The monsters and creatures in the Telengard dungeon will not wait for you to react, so quick wits and reflexes are needed! Will you return from the cruel labyrinth to tell tales of horror, despair, great treasure and magic? Or will you be another of the foolish ones, only to perish in the dark depths? Commodore 64, TRS-80 Mods. I/III (32K), Atari 800/1200 (48K) cassette $23.00, Apple II (48K), Atari 800/1200 (48K), TRS-80 Mods. I/III (48K) diskette $28.00 each.

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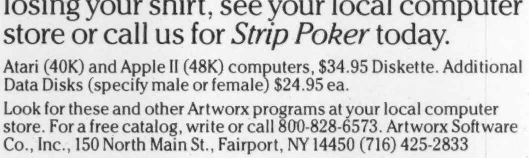

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pressed/elongated or full elongated modes . . . printed at 6, 8, or 12 lines per inch. My basic listings are no longer impossible to see without my glasses, and when I give speeches and talks, the elongated mode really beefs up the notes for my aging eyes.

Another advantage of modifying font and spacing is the ability to pack data onto fewer pages. This article runs about two and a half double-spaced pages of normal typing, yet it fits handily onto about two thirds of a page, still double-spaced, in condensed form at 12 LPI.

I would still like to have a *Scripsit* modification which fully supports these controls from inside the program, but it is such a terrific word processing system and so darned inexpensive that I can't complain now that I have this little utility program. ☐

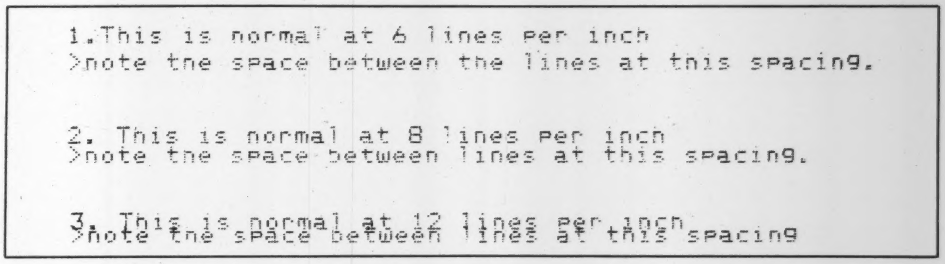

Figure 2.

```
1.This is normal at 6 lines per inch
>note the space between the lines at this spacing.


2. This is normal at 8 lines per inch
>note the space between lines at this spacing.


3. This is normal at 12 lines per inch
>note the space between lines at this spacing
```

```
10 '** FONT/BAS -  COMPOSER  UTILITY FOR LINE  PRINTER  VI
::: BY TED BYRNE  - 3/11/82  -  C.  BYRNE/SOFT ASSOCIATES,
SOUTH HADLEY, MA.

20 '** THIS IS THE PART THAT SELECTS THE PITCH **

30 CLS:LPRINT; CHR$(30);
40  PRINT:PRINT:INPUT  "RESET  THE PRINTER  THEN  PRESS  <
ENTER > ....";E$
50 CLS:PRINT"WHAT FONT DO YOU WANT ?"
60 PRINT"      1. NORMAL"
70 PRINT"      2. CONDENSED"
80 PRINT"      3. ELONGATED/COMPRESSED"
90 PRINT"      4. ELONGATED"
100 PRINT:PRINT
110 PRINT"                          ENTER 1-4"
120 A$=INKEY$:IF A$="" THEN 120
130 A=VAL (A$): IF A<1 OR A>4 THEN 50
140 ON A GOTO 200, 300, 400, 500
200 LPRINT; CHR$(30);:GOTO 700: '  ** NORMAL
300  LPRINT;  CHR$(30);:  LPRINT;CHR$(27);  CHR$(14);:GOTO
700: ' **ELONGATED
400  LPRINT;  CHR$(31);:LPRINT;  CHR$(27);CHR$(14);:  GOTO
700: ' ** ELONGATED CONDENSED
500 LPRINT; CHR$(31);:' ** ELONGATED
700 CLS

710 '** THIS PART DETERMINES THE SPACING **

720 PRINT"WHAT VERTICAL SPACING DO YOU WANT ?"
730   PRINT:PRINT:PRINT"        1.  6  LINES   PER   INCH
(NORMAL)."
740 PRINT"        2. 8 LINES PER INCH ."
750 PRINT"        3. 12 LINES PER INCH."
760 PRINT:PRINT
770 PRINT"             < ENTER > 1-3"
780 L$=INKEY$: IF L$="" THEN 780
790 L=VAL (L$): IF L<1 OR L>3 THEN GOTO 700
800 ON L GOTO 810, 820, 830
810 LPRINT CHR$ (27);CHR$(54): GOTO 850
820 LPRINT CHR$ (27); CHR$(56): GOTO 850
830 LPRINT CHR$ (27); CHR$(28): GOTO 850
850 CLS:CMD"S"
```

Mr. Epson, Meet Mr. Pascal

Carlton P. Russell, Jr.

The first topic for discussion between Mr. Pascal and Mr. Epson is the Pascal technique for routing the output to the printer. One way is illustrated in the program listing of PrintTest shown in Listing 1. This illustration is not intended to be an example of good programming practice, but is intended rather to be an "unretouched" record of an original Pascal program that prints examples of the various Epson operating modes.

This program was developed and executed on an Apple II+ (64K) with a language card, Videx Videoterm 80-column board, and Paymar chip. Apple UCSD Pascal 1.1 was the programming language. The printer is an Epson MX-80 F/T.

The technique used here is to declare a variable called OUTFILE to be of type TEXT and then associate that variable with the system file named PRINTER:. This is shown in the REWRITE statement at the beginning of the procedure FIRST. The WRITELN statements which are intended for the printer must have OUTFILE as the first parameter. Output statements intended for the screen do not use a special parameter in the WRITELN statement. The output statement at the end of the main program (near the end of the listing) illustrates this operation.

The program was written by first attempting an operating mode and then switching that mode off to be sure that the printer would come back to the normal mode each time. The program structure was intended to be a simple linear list of output statements; however, the size limitations of procedures caused the primary procedure to be broken into two procedures FIRST and REST.

Since OUTFILE was declared in the main program, it is a global variable which can be used in any of the procedures. The function CHR is used within the WRITELN statements to convert the integer codes to the ASCII form needed for transmission to the printer. A similar process involving the CHR$ function is used in the Epson manuals for illustrating the use of the printer command codes in the basic language.

The printed output resulting from the execution of this program is shown in Figure 1. The title is produced using the double width, double strike, enhanced combination. This combination is then explicitly turned off. Note in the listing that the title has six double width spaces before the title words to center the title.

A printout using the normal default operating mode is produced following each of the experiments. The regular double width technique is tried next. Then the normal size, enhanced print example is shown. Examples of the various sizes and print techniques are shown along with the codes which turn them on and off. While this demonstration output provides the codes necessary for using the various options of the Epson, it does seem to suffer from a lack of organization.

The second topic for Mr. Epson to share with Mr. Pascal, Mrs. Basic, and Miss *Executive Secretary* concerns a way to organize and keep track of the various printer control codes. While generating the program listing and the demonstration output from the PrintTest, a way to organize the operating modes into a table based on the character sizes and the printing techniques was developed. The results are shown in Figure 2.

The left side of the table shown in Figure 2 lists the four character sizes starting with the small compressed characters which allow 132 characters in an 8″ line. The normal size characters which are printed 80 per line are listed next. The third row lists the oversize characters which are printed 66 to the line. The last row lists the large double width characters which are printed 40 characters per 8″ line.

The column headings across the top of the page show the four printing techniques starting with the normal single strike mode and generally increasing in print density (boldness) as one moves to

---

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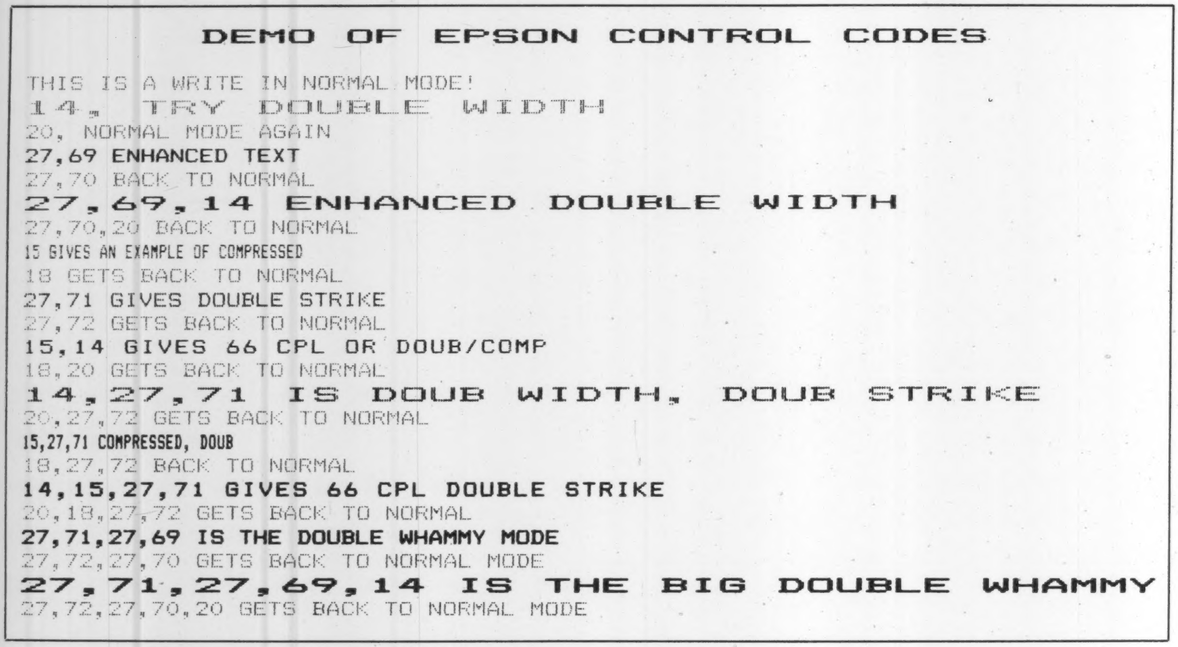
the right in the table. The second column lists the double strike (two-pass) mode.

The third column lists the enhanced mode in which the printhead is moved slightly and the character is printed again as the printhead moves across the page. The last column lists the technique in which the enhanced mode is used twice (double strike) to produce an unusually bold image.

Note that four sizes time four styles sounds a great deal like 16 modes; however, literature says that the Epson has 12 variations. Sure enough, the manuals are clear that the compressed size options and the enhanced print style are not to be used together. The four sections in the table which are marked with dashes are the four modes which involve these excluded combinations. The nor-

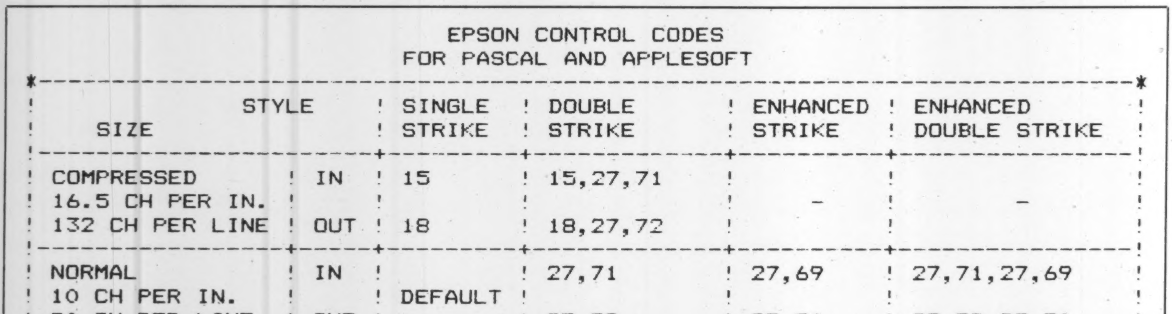
Figure 1. The output from the PrintTest program shows the codes and illustrates the various size and printing modes of the Epson MX-80 printer.



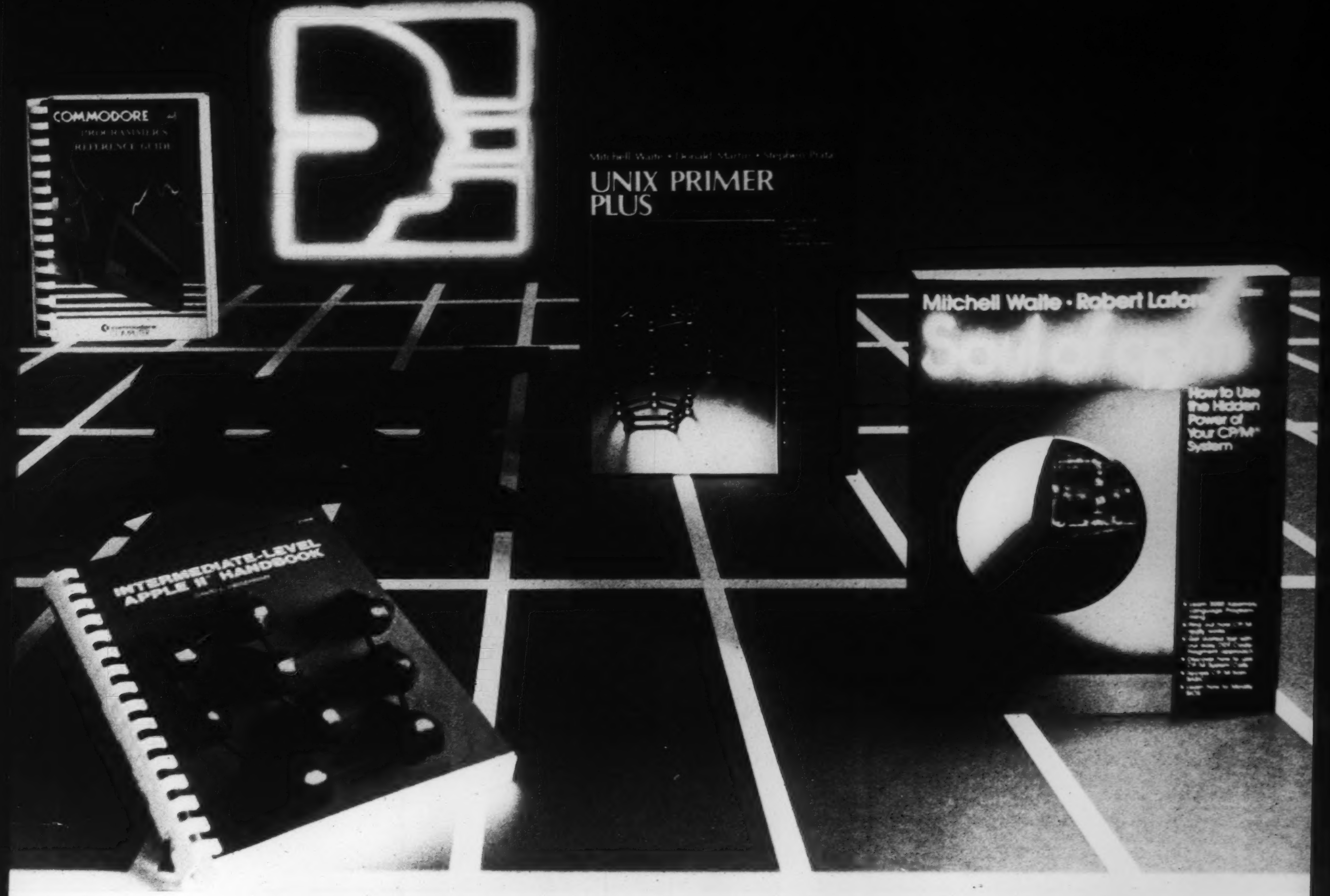
```
          DEMO OF EPSON CONTROL CODES

THIS IS A WRITE IN NORMAL MODE!
14, TRY DOUBLE WIDTH
20, NORMAL MODE AGAIN
27,69 ENHANCED TEXT
27,70 BACK TO NORMAL
27,69,14 ENHANCED DOUBLE WIDTH
27,70,20 BACK TO NORMAL
15 GIVES AN EXAMPLE OF COMPRESSED
18 GETS BACK TO NORMAL
27,71 GIVES DOUBLE STRIKE
27,72 GETS BACK TO NORMAL
15,14 GIVES 66 CPL OR DOUB/COMP
18,20 GETS BACK TO NORMAL
14,27,71 IS DOUB WIDTH, DOUB STRIKE
20,27,72 GETS BACK TO NORMAL
15,27,71 COMPRESSED, DOUB
18,27,72 BACK TO NORMAL
14,15,27,71 GIVES 66 CPL DOUBLE STRIKE
20,18,27,72 GETS BACK TO NORMAL
27,71,27,69 IS THE DOUBLE WHAMMY MODE
27,72,27,70 GETS BACK TO NORMAL MODE
27,71,27,69,14 IS THE BIG DOUBLE WHAMMY
27,72,27,70,20 GETS BACK TO NORMAL MODE
```

Figure 2. The tabulation of Epson printer control codes provides an orderly organization for the codes by size and print style.



```
                          EPSON CONTROL CODES
                        FOR PASCAL AND APPLESOFT
*-----------------------------------------------------------------------------------*
!                STYLE   ! SINGLE   ! DOUBLE         ! ENHANCED  ! ENHANCED          !
!   SIZE                 ! STRIKE   ! STRIKE         ! STRIKE    ! DOUBLE STRIKE     !
!------------------------+----------+----------------+-----------+-------------------!
! COMPRESSED       ! IN  ! 15       ! 15,27,71       !           !                   !
! 16.5 CH PER IN.  !     !          !                !     -     !         -         !
! 132 CH PER LINE  ! OUT ! 18       ! 18,27,72       !           !                   !
!------------------+-----+----------+----------------+-----------+-------------------!
! NORMAL           ! IN  !          ! 27,71          ! 27,69     ! 27,71,27,69       !
! 10 CH PER IN.    !     ! DEFAULT  !                !           !                   !
! 80 CH PER LINE   ! OUT !          ! 27,72          ! 27,70     ! 27,72,27,70       !
!------------------+-----+----------+----------------+-----------+-------------------!
! DOUBLE WD/COMP.  ! IN  ! 14,15    ! 14,15,27,71    !           !                   !
! 8.25 CH PER IN.  !     !          !                !     -     !         -         !
! 66 CH PER LINE   ! OUT ! 20,18    ! 20,18,27,72    !           !                   !
!------------------+-----+----------+----------------+-----------+-------------------!
! DOUBLE WIDTH     ! IN  ! 14       ! 14,27,71       ! 27,69,14  ! 27,71,27,69,14    !
! 5 CH PER INCH    !     !          !                !           !                   !
! 40 CH PER LINE   ! OUT ! 20, EOL  ! 20,27,72       ! 27,70,20  ! 27,72,27,70,20    !
*-----------------------------------------------------------------------------------*
```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mal size, single strike combination is marked DEFAULT to show that this is what you get if you do not turn on the other modes.

Most of the sections of the table have an IN and an OUT identification. The IN notation means that the codes shown are used to get into the mode identified by that row and column. The OUT notation means that the codes shown are used to get out of the special mode and back to the normal default mode.

Note that the double width row at the bottom is a special exception in which reaching the end of a line (EOF) turns off the double width part of all four of the double width options but may leave on any density modes. Some direct transitions from one special mode to another without going through "normal" have been successful; however, all 132 transitions have not been demonstrated here.

The numbers in the sections of the table are the ASCII codes representing the characters which are used to control the Epson printer. For example, 27 is the code for escape and 69 is the code for the letter E. The sequence of an escape followed by an E turns on the enhanced mode for normal size characters (second row, next to righthand column of Figure 2).

An example of the use of the codes in the table is shown in Listing 2. Suppose you wanted to initialize the printer for the normal size, enhanced, double strike mode prior to running a Pascal program. You decided not to modify the program itself. One way to do this is shown in the program ENHANDUB in Listing 2.

Mr. Epson and Mr. Pascal are expected to be cooperative coworkers for a long time to come.

This program executes to send the four codes, 27, 71, 27, and 69, to the printer and initialize it for later printing. As long as the power is applied to the printer and other control codes are not transmitted, it will print in the normal size, enhanced, double strike mode.

Note that the table shown in Figure 2 is a useful reference for Applesoft Basic and perhaps other Basics using the CHR$ function as well as for Pascal using the CHR function. The *Executive Secretary* word processing system (Sof/Sys, Inc., 4306 Upton Ave. S., Minneapolis, MN 55410) provides for a straightforward way to use these same codes to control the printer from within the text of a document.

All 12 of the modes in Figure 2 are demonstrated in the PrintTest listing and the sample output is shown in Listing 1 and Figure 1. After each mode is turned on, the codes which return the operations to normal are also exercised.

Mr. Epson and Mr. Pascal have met and they have talked in a variety of pleasing ways. They are expected to be cooperative coworkers for a long time to come. □

Listing 1. The listing of the Pascal program PrintTest shows techniques for controlling and routing output to the Epson printer.

```
PROGRAM PRINTTEST;
VAR
  OUTFILE:TEXT;
PROCEDURE FIRST;
BEGIN
  REWRITE(OUTFILE,'PRINTER:');
  WRITELN(OUTFILE,CHR(27),CHR(71),CHR(27),CHR(69),CHR(14),
          '       DEMO OF EPSON CONTROL CODES       ');
  WRITELN(OUTFILE,CHR(27),CHR(72),CHR(27),CHR(70),CHR(20));
{normal mode} WRITELN(OUTFILE,'THIS IS A WRITE IN NORMAL MODE!');
{double width} WRITELN(OUTFILE,CHR(14),'14, TRY DOUBLE WIDTH');
               WRITELN(OUTFILE,CHR(20),'20, NORMAL MODE AGAIN');
{enhanced text} WRITELN(OUTFILE,CHR(27),CHR(69),'27,69 ENHANCED TEXT');
                WRITELN(OUTFILE,CHR(27),CHR(70),'27,70 BACK TO NORMAL');
{enhanced double width} WRITELN(OUTFILE,CHR(27),CHR(69),CHR(14),
                        '27,69,14 ENHANCED DOUBLE WIDTH');
                        WRITELN(OUTFILE,CHR(27),CHR(70),CHR(20),
                        '27,70,20 BACK TO NORMAL');
{compressed width}
  WRITELN(OUTFILE,CHR(15),'15 GIVES AN EXAMPLE OF COMPRESSED');
  WRITELN(OUTFILE,CHR(18),'18 GETS BACK TO NORMAL');
{double strike}
  WRITELN(OUTFILE,CHR(27),CHR(71),'27,71 GIVES DOUBLE STRIKE');
  WRITELN(OUTFILE,CHR(27),CHR(72),'27,72 GETS BACK TO NORMAL');
{double width/compressed}
  WRITELN(OUTFILE,CHR(15),CHR(14),'15,14 GIVES 66 CPL OR DOUB/COMP');
  WRITELN(OUTFILE,CHR(18),CHR(20),'18,20 GETS BACK TO NORMAL');
END;
PROCEDURE REST;
  BEGIN
{double width, double strike}
  WRITELN(OUTFILE,CHR(14),CHR(27),CHR(71),
         '14,27,71 IS DOUB WIDTH, DOUB STRIKE');
  WRITELN(OUTFILE,CHR(20),CHR(27),CHR(72),
         '20,27,72 GETS BACK TO NORMAL');
{compressed, double strike}
  WRITELN(OUTFILE,CHR(15),CHR(27),CHR(71),'15,27,71 COMPRESSED, DOUB');
  WRITELN(OUTFILE,CHR(18),CHR(27),CHR(72),'18,27,72 BACK TO NORMAL');
{double width/compressed/double strike}
  WRITELN(OUTFILE,CHR(14),CHR(15),CHR(27),CHR(71),
         '14,15,27,71 GIVES 66 CPL DOUBLE STRIKE');
  WRITELN(OUTFILE,CHR(20),CHR(18),CHR(27),CHR(72),
         '20,18,27,72 GETS BACK TO NORMAL');
{double strike/enhanced/normal size}
  WRITELN(OUTFILE,CHR(27),CHR(71),CHR(27),CHR(69),
         '27,71,27,69 IS THE DOUBLE WHAMMY MODE');
  WRITELN(OUTFILE,CHR(27),CHR(72),CHR(27),CHR(70),
         '27,72,27,70 GETS BACK TO NORMAL MODE');
{double strike/enhanced/double size}
  WRITELN(OUTFILE,CHR(27),CHR(71),CHR(27),CHR(69),CHR(14),
         '27,71,27,69,14 IS THE BIG DOUBLE WHAMMY');
  WRITELN(OUTFILE,CHR(27),CHR(72),CHR(27),CHR(70),CHR(20),
         '27,72,27,70,20 GETS BACK TO NORMAL MODE');
  END;
BEGIN
  FIRST;
  REST;
  WRITELN('THE END');
END.
```

Listing 2. The program ENHANDUB executes to initialize the Epson printer for normal size, enhanced, double strike printing.

```
PROGRAM ENHANDUB;
VAR OUTFILE:TEXT;
BEGIN
REWRITE(OUTFILE,'PRINTER:');
WRITELN(OUTFILE.CHR(27),CHR(71),CHR(27),CHR(69));
END.
```

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I speak from my own experience. I had more trouble with the Epson printer manual than I did with the *Easy Writer* instructions. So I come not to slay *Easy Writer* or Epson, but to help you by sharing some basic procedures.

The purpose of all which has been said to this point is not to be cute. It is to suggest that there are many computer users like myself who are basically writers looking for a better way of producing their documents. We are intrigued and fascinated with word processing but find computer manuals filled with a strange gobbledygook that frustrates our creative production. So what is to be presented here is a simple instruction book on how to use *Easy Writer,* the IBM Personal Computer, and the Epson MX-80F/T to produce quality letters, manuscripts, addressed envelopes (not labels), and other business documents on single sheets and on your own stationery without purchasing any additional equipment.

There is good reason for making *Easy Writer* work. First, you may have half of a novel and six short stories already on *Easy Writer* disks. If you have to retype all of this to use a new word processing program, you have lost a great deal of valuable creative production time. Alternatively, you could develop your own software program to read *Easy Writer* disks and transfer the information to the new word processing program. While you may be curious and intrigued about programming, if you are indeed a creative rather than a program writer, you probably want to get on with your creative effort.

Single Sheet Printing

First, the Epson printer must be programmed for single sheet printing. The IBM, Epson, and *Easy Writer* manuals are equally vague on this. The process involves two imbedded commands. The first is Ctrl-0, Esc-8. If you do not do this, your printer stops printing two inches from the bottom of the page and begins its obnoxious "feed me" buzzer sound.

The second imbedded command is .FORMSTOP which stops the printer at the end of each page giving you time to insert a new sheet. The computer devotee will tell you such operations are slow and old-fashioned, and you should use fanfold paper. Try this method first.

Another difficulty you will encounter is that some *Easy Writer* embedded commands for margin, spacing, and type selection cause the platen to advance a line, fouling up spacing on your document. This can be overcome by using a separate header file.

Then there are the problems with the starting point for fanfold forms versus the starting point for single sheets. You want the sheet to be under the rollers on the platen. But if you start with the paper under the rollers, it prints off the bottom of the page. All of this is enough to discourage you from making the next payment on the system.

So let's assume you want to write several very important business letters with one inch margins top and bottom and on each side of 8 ½ by 11 bond paper.

Formatting Letters

First, create an embedded commands header which will include:

```
>.FORMSTOP
>.CTRL O, ESC E
>.CTRL O, ESC G,
>.CTRL O, ESC 8
>.PAGELINES59
>.LINES53
>.MARGIN8
>.TOP0
>.SPACE0
```

Then SAVE this header, and name it LTR FM HD (Letter Form Heder). Remember that each of these lines must be followed by a paragraph marker (RETURN).

Now, put an old sheet of paper in the printer. From the editor, press F-2, and this header will spit out the piece of paper you have just put in with no printing on it and program the Epson printer for the letters you want to write.

Next go to your *Easy Writer* File System (F-10) and Protect (P) your LTR FM HD file.

Clear your text, and you are ready to begin your letter. You do not need to embed any additional commands.

Be sure to SAVE this file, revise frequently, and set your margins in additional commands (F-4) at 0,62,5. This accomplishes your goal of a one inch margin left, right, top and bottom.

If your letter is a one page document, and if your business stationery has a logo at the top which requires starting lower on the page, your own LTR FM HD will vary in both the TOP and LINES commands. There are six lines to the inch, so if you want to start printing 1.5 inches from the top rather than one, change these commands (for a one page letter) to .TOP3 and .LINES49.

If your stationery requires starting

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Easy Writer, continued...

more than one inch down from the top, and if your letter is more than one page and you want the one inch margin top and bottom on the second page, you must make compensations in your text file rather than in your LTR FM HD file. At the start of your text, repeat one of the embedded commands from the LTR FM HD file, such as TOP0. Then use your F-3, insert a line, command to move your text down the screen the necessary number of lines. This affects only the first page of your letter.

When you have completed your text composition and have pressed F-10, gone into your file system, and done the last R (revise), and P (protect), then G (get) your LTR FM, HD file. While you are still in the file system, print your LTR FM HD file (H) making sure the printer is on and ready. This is a double check to make certain your printer is programmed.

While still in the file system get (G) the text file you have just created.

Put your stationery into the printer. The LTR FM HD you have created requires that the top of the paper be even with the top of the horizontal metal plate above the platen.

While in the file system, print (H) your text file.

Addressing Envelopes

Now you must address the envelope. That's easy. You use the program listed above, except that you change the numbers on three lines. Change the MARGIN to 30, PAGELINES to 15, and LINES to 5.

If you address envelopes frequently, you will want to save this program, which I call ENV FM HD (Envelope Form Header).

You can also use the program for mailing lists and to print the addresses from your mailing list directly onto the envelopes so they appear to be individually addressed.

First, create a file for your mailing list. All the names can go into one file, but be sure to use only four lines per address.

Use F-3 (insert line) to put a space between each address. This separates them for your eye on the screen as well as for the printer program (ENV FM HD).

Print your ENV FM HD file.

Call up your mailing list file.

Insert the first envelope. Position the head of the printer on the envelope where you want the address to start.

Print your mailing list.

Manuscripts

Writers' Market has a section on how you should type a manuscript. It is simple enough, just print your name, address, and telephone number in the upper lefthand corner of the first page, single-spaced, and the number of words in your manuscript and the rights you are requesting on your article or story in the upper righthand corner. Your name should also appear on each following page along with the page number. Your title, byline, and story should start half way down the first page. Can you do this with *Easy Writer* and Epson? Certainly! Just follow these steps:

Your embedded commands file is the same as our LTR FM HD file with one exception. Delete the space command.

In your manuscript file, you will want to embed four commands intermixed with your text as follows:

- `SPACE0`
- `TITLEA,1,` (your name), `Page`
- `PAGE1,nn.` (nn is determined by the number of spaces in your name plus the number of spaces for the comma and "page" and the space following page.)
- Then type in your address and the number of words in your article on the first line, the city and state and zip and the rights requested on the second line, and your phone number on the third line.
- Following your phone number, enter the fourth embedded command: `.SPACE1.`
- Type in the title of your story, and insert eight lines between the fourth embedded command and your title.

That done, go to your file system (F-10) and save this start of your text. Once you have finished your text, revised and protected it, proceed to the next step.

Go to F-4 and into page settings (P) and check your spacing for the first two pages. Watch particularly the spacing of the title/page line. One quirk of *Easy Writer* causes the title line to be indented if the last line on the previous page is an indented line.

If the title line is single-spaced right above the start of your text, you can add one line (F-3) above your SPACE1 command at the start of your text. Return to the editor and revise as needed.

Proceed with your text composition and printing as for the letter described above.

And there you have it. However, as I read back over this, there are some observations I should make. First, six months ago I would not have been able to write this, and I can see gobbledygook creeping into it with talk of embedded commands, files, and formstops. I apologize if I have confused you.

Second, I must confess that a good deal of what I have learned has not come because of any great intelligence. A good deal of it has come by accident, trial and error, and patience. And finally, each little thing you learn may open doors to new computer possibilities for you. I hope I have done this for you. ☐

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LetterWrite

James Byron

LetterWrite is a program designed to be used on an Apple II Pascal system in conjunction with an Integral Data Systems 440-G printer. With it you can make as many copies of a text file as you want. The program accepts control characters from the text to change from normal to enhanced mode or to change the character density. The program will work with any printer if the CONTROLCHECK procedure is omitted and I suspect that it will work as is with any IDS printer.

To use the program, simply enter your text file into the Pascal text editor. If you wish, you may format your text using the up arrow key to send control characters to the printer. Although this precludes the insertion of the up arrow character in your text, you may do any of the following:

1. Print in normal mode
2. Print in enhanced mode
3. Print at 8.3 characters per inch
4. Print at 10 characters per inch
5. Print at 12 characters per inch
6. Print at 16.5 characters per inch

By using the Set Environment command of the text editor to set Auto Indent to false and Filling to true, you can use the text editor to write all your letters. Once they are saved on disk, the copy program will give you as many copies as you desire. Happy word processing! ☐

James Byron, 529 N. East St., Raleigh, NC 27604.

```
PROGRAM LETTERWRITE;

VAR COUNTER,NUMBER:INTEGER;
      S:STRING;
      F:TEXT;
      CH:CHAR;
      F1:INTERACTIVE;

PROCEDURE ASK;

BEGIN
  WRITELN;
  WRITELN('PLEASE TURN YOUR PRINTER ON');
  WRITE('HOW MANY COPIES?');
  READLN(NUMBER);
  WRITE('WHAT DO YOU WISH TO COPY?');
  READLN(S);
  WRITE(CHR(12));
END;


PROCEDURE CONTROLCHECK;(*OMIT THIS PROCEDURE IF YOU DO NOT HAVE AN I.D.S.
                       PRINTER*)


BEGIN
  READ(F,CH);
  CASE CH OF
    'A':WRITE(F1,CHR(1));(*CTRL-A ENHANCED MODE*)
    'B':WRITE(F1,CHR(2));(*CTRL-B NORMAL MODE*)
    'C':WRITE(F1,CHR(3));(*CTRL-C GRAPHICS MODE*)
    '/':WRITE(F1,CHR(28));(*CTRL-\ 8.3 CHAR/INCH*)
    ']':WRITE(F1,CHR(29));(*CTRL-] 10 CHAR/INCH*)
    '↑':WRITE(F1,CHR(30));(*CTRL-↑ 12 CHAR/INCH*)
    '-':WRITE(F1,CHR(31));(*CTRL-- 16.5 CHAR/INCH**)
  END;
  READ(F,CH);
```

```
    IF CH='↑' THEN
    BEGIN
      CONTROLCHECK;
      EXIT(CONTROLCHECK);
    END;
  END;

  PROCEDURE COPY;



  BEGIN
    RESET(F,S);
    RESET(F1,'PRINTER:');
    WHILE NOT EOF(F) DO
    BEGIN
      WHILE NOT EOLN(F) DO
      BEGIN
        READ(F,CH);
        IF CH='↑' THEN CONTROLCHECK;(*CHECK FOR CONTROL CHARS. OMIT THIS
                                      LINE IF YOU DO NOT HAVE AN I.D.S.
                                      PRINTER*)
        WRITE(F1,CH);
      END;
    READLN(F);
    WRITELN(F1);
  END;
  PAGE(F1);
  CLOSE(F1);
  CLOSE(F,LOCK);(*CLOSE AND SAVE COPIED FILE*)
END;

  BEGIN
    ASK;
    FOR COUNTER:=1 TO NUMBER DO(*PRINT THE APPROPRIATE NUMBER OF COPIES*)
    BEGIN
      COPY;
    END;
    RESET(F1,'PRINTER:');
    PAGE(F1);
    CLOSE(F1);
  END.
```

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A Peek Through The Magic Window

Cary D. Corbin

When you are trying to convince your spouse to let you buy a home computer, anything that will display its usefulness in his or her terms is a great help. The programs that finally sold my wife on the system were the word processors. She is a professional secretary and was quick to grasp the beauty of a word processing system.

Before retiring from a full time paying job to raise our kids, she had an IBM electronic typewriter with a heart of pure silicon. This machine had the rudiments of a word processor, but was limited in its functions. Then her employer installed a full-blown Xerox word processor. While I was forced to admit that an Apple-based system would never match the utility of that $20,000 system, I could honestly point out that it fell somewhere between her electronic IBM and the Xerox, for about the same money as the IBM.

I began sharing *Creative's* reviews of Apple-based word processors with her, her enthusiasm grew, she got several book manuscripts to type . . . We now own an Apple system complete with Epson printer and *Magic Window* word processor.

The *Magic Window* system is one of the neatest low cost word crunchers for the Apple. Its features are too numerous to discuss here, but for those who are interested *Creative Computing* did a review in the 1982 Software Buyer's Guide issue. In fact, it was that review that sold us on the system.

I differ with that review in only one respect: a fast typist *can* overtype the program and lose a letter as the line wraps around. My wife types close to 85 wpm average and on short, common words like *and* and *the* her speed approaches that of light. When one of these words comes at the end of a line, it frequently loses something in the wraparound. The only other complaint she has about the system is that she can never remember the steps to initialize a data disk to store her files. Hence, the following solution.

By eliminating DOS and the Hello program, an extra 34 sectors or so are freed for data storage.

These two programs and EXEC file will automatically initialize a *Magic Window* data disk, transfer the SYS.OPTIONS file, and scratch the DOS image and Hello program. By eliminating DOS and the Hello program, an extra 34 sectors or so are freed for data storage.

Entering this set of programs is quite simple.

Type in the program Lomem Reset and save it on a *Magic Window* data disk. (If you don't want to keep them on a data disk, use the FID program on the Apple System Master disk to transfer the SYS.OPTIONS file from a *Magic Window* data disk.)

Type in the program Magic Initialize and save it on the same disk as Lomem Reset.

Use the Make Text program on the Apple System Master disk to create a text file called MAGIC. Instructions for using the Make Text program are given in the Apple DOS manual, pp. 61-64. This file should contain these instructions:

```
RUN LOMEM RESET
BLOAD SYS.OPTIONS
RUN MAGIC INITIALIZE
```

This file is then saved on the same disk as the Lomem Reset, Magic Initialize, and SYS.OPTIONS files.

Your automatic initializer is now ready to use. Fire up Applesoft, insert the disk with these programs on it, type:

```
EXEC MAGIC
```

Listing 1. Lomem Reset.

```
99  REM
100  REM   LOMEM RESET
101  REM
110  REM  RESET MEMORY POINTERS TO MOVE PROGRAM AWAY
111  REM  FROM THE SYS.OPTIONS FILE
112  REM
120  POKE 104,64: POKE 103,1: POKE 16384,0
130  NEW
139  REM
140  REM  COURTESY OF APPLE CART
141  REM  DEC, 1981
```

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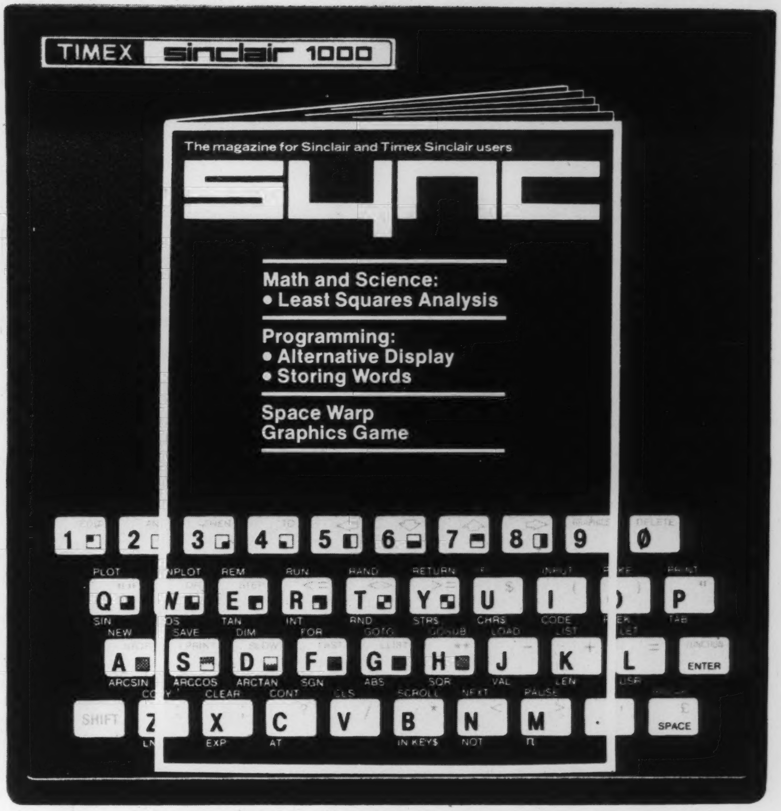
Magic Window, continued...

Press RETURN and follow the prompts given in the program.

Remember the following cautions: Both DOS and the memory pointers are altered. If your typing errors cause the program to crash and you don't get the NORMAL EXIT message, the alterations have *not* been repaired. If this happens, you can reboot DOS with the System Master disk. There are less drastic ways, but they are beyond the scope of this article. □

Listing 2. Magic Initialize.

```
5 FLG = 0: ONERR  GOTO 1000
10 D$ =  CHR$ (4): REM  CTRL-D
100  TEXT : HOME : SPEED= 255
110  PRINT "THIS PROGRAM WILL INITIALIZE A DATA"
120  PRINT "DISK FOR USE WITH THE MAGIC WINDOW"
130  PRINT "WORD PROCESSOR."
140  PRINT : PRINT "MAGIC WINDOW IS A TRADEMARK OF:"
145  PRINT : PRINT
150  PRINT  TAB( 15)"ARTSCI INC."
160  PRINT  TAB( 11)"10432 BURBANK BLVD."
170  PRINT  TAB( 7)"NORTH HOLLYWOOD, CA  91601"
180  PRINT : PRINT "    ONE OF THE NEATEST LITTLE WORD"
190  PRINT  TAB( 5)"PROCESSORS ON THE MARKET."
199  REM  HOLD OLD VALUES BEFORE CHANGING DOS
200  FOR I = 0 TO 2
210 HOLD%(I) =  PEEK (46922 + I)
220  NEXT
230 HOLD%(3) =  PEEK (44723)
298  REM  ALTER DOS THANKS TO JAMES GANT
299  REM  PUBLISHED IN NIBBLE VOL.3 #4
300  FOR I = 46922 TO 46924
310  READ P: POKE I,P
320  NEXT
330  POKE 44723,4
340  RESTORE :FLG = 1
350  DATA  96,234,234
360  PRINT : PRINT : FLASH : PRINT "DOS HAS BEEN ALTERED!!": PRINT "LOMEM
     POINTERS HAVE BEEN ALTERED!!!": NORMAL
370  PRINT "ANY ABNORMAL EXIT FROM THIS PROGRAM"
380  PRINT "WILL LEAVE THEM ALTERED!!"
390  GOSUB 2000
399  REM  INITILIZE SECTION
400  HOME : VTAB 8
410  PRINT "INSERT DISK TO BE INITIALIZED"
420  PRINT : PRINT "PRESS <RETURN> TO INITIALIZE"
430  PRINT "PRESS <ESC> TO ABORT ";: GET A$: PRINT
440  IF A$ =  CHR$ (27) THEN 1100
450  IF A$ <  >  CHR$ (13) THEN 400
460  HOME : VTAB 8
470  INPUT "VOLUME NUMBER? ";A$:V% =  VAL (A$)
480  IF V% > 1 AND V% < 255 THEN 500
490  PRINT "INVALID VOLUME NUMBER": PRINT "ALLOWABLE RANGE IS 1 THROUGH 25
     4"
495  GOSUB 2000: GOTO 460
500  PRINT D$;"INIT HELLO,V";V%
510  PRINT D$;"DELETE HELLO"
520  PRINT D$;"BSAVE SYS.OPTIONS,A2749,L12"
540  HOME : PRINT D$;"CATALOG"
550  GOSUB 2000
599  REM  DO ANOTHER ONE?
600  HOME : VTAB 8
610  PRINT "WANT TO DO ANOTHER DISK (Y/N)? ";: GET A$: PRINT
620  IF A$ = "N" THEN 1100
630  IF A$ = "Y" THEN 400
640  GOTO 600
999  REM  ERROR SECTION
1000  HOME : VTAB 8
1010 LINE =  PEEK (218) + 256 *  PEEK (219)
1020  PRINT "ERROR TYPE: "; PEEK (222)
1025  PRINT "IN LINE # ";LINE
1030  PRINT "SEE APPLESOFT MANUAL P. 136"
1040  PRINT "OR DOS MANUAL P. 114"
1050  GOSUB 2000: GOTO 610
1099  REM  PUT DOS BACK TO RIGHTS
1100  IF FLG = 0 THEN  END
1105  FOR I = 0 TO 2
1110  POKE 46922 + I,HOLD%(I)
1120  NEXT
1130  POKE 44723,HOLD%(3)
1140  HOME : VTAB 8
1150  PRINT "NORMAL EXIT...DOS IS RESTORED."
1159  REM  RESET LOMEM TO NORMAL $801
1160  POKE 103,1: POKE 104,8: POKE 2048,0
1165  PRINT "                  MEMORY POINTERS RESTORED."
1169  REM  PROGRAM WILL NO LONGER FUNCTION, SO WE WILL WIPE IT OUT
1170  END : NEW
2000  PRINT : PRINT "PRESS ANY KEY TO CONTINUE ";: GET A$: PRINT : RETURN
```



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A Poor Man's Spelling Verify Program

Charles D. Arceneaux

Some people think that a spelling verify feature in word processing is an unnecessary luxury. These are people who seem instinctively to know how every word in the English language is spelled. But for thick skulls like me, a proofreading aid is essential. Unfortunately, thick skulls like me don't always have an understanding spouse—after spending all that money on a letter quality printer, what's left over had better go for groceries.

The solution? Simple. I have Extended Disk Basic on my Micromation computer. Why not write my own? My confidence in my ability to write my own is augmented by the fact that I was on a team that wrote a spelling verify feature for a mini-computer manufacturer. Based on my experience there, I had a good mental picture of what an interactive spelling verifier should look like. Here are the essentials:

Dictionary

The dictionary is the most important part of a spelling verifier, so don't be surprised if most of this article is on this subject.

It need not contain all the words in the English language, just the words in the user's vocabulary. As such, it must start out small and be able to grow as it is used. It must include all forms of the words in it—forbid, forbidden, forbidding, forbade, and, of course, forbids. Funk and Wagnalls also includes "forbidal" which is not in my vocabulary, so it should not be included in my dictionary.

The dictionary is the most important part of a spelling verifier.

Some dictionaries list each form separately, others contain coded instructions that allow reconstruction of each form. There are obviously advantages to each scheme. The method to be used must be worked out in the design phase of the project, and the decision should be made based on the access methods that are available.

A format that allows all forms of a word in the same entry goes like this:

forbid,,den,ding,s;

The words must only be reconstituted if there is a match in the first part of the word. I have seen this scheme used on a system that had only one file type, that is a page-oriented serial or document file. The verification was done on an entire page of text at a time. The page was held in memory and accessed randomly while the dictionary was read through serially.

Since it skipped around the page while checking words, the program waited until the whole page had been checked before feeding back to the user the words that were wrong. I thought this program was awkward to use, but since it was one of the first verify programs on the market, I can't be too critical of it.

If a truly random file, (called a direct file on some systems and an indexed sequential file on others) is available, then the problem of designing a dictionary is simplified. With one entry for each word, you simply set each word up as a key and do a random seek. If there is a valid read on the file, then the word is good; if an invalid read is detected, the word is bad. This method is much more straightforward because the document can be scanned serially while the dictionary is accessed randomly. It does present another problem though.

This problem is that most direct files rely on fixed length keys. This means that the file length will be the maximum

---

Charles D. Arceneaux, 203 Amesbury Dr., Lafayette, LA 70507

word length multiplied by the number of word entries. A typical file of 50,000 words with a maximum word size of 25 would take 1,250,000 bytes of file space, plus whatever overhead the access method imposed. In my mind, this is not practical for personal computer users.

Fortunately, there is an easy solution to this problem. That is to segment the dictionary by word size. Thus, you could have one dictionary for short words and another for longer words. You could even go all out and have 24 dictionaries, one each for words of length two through 25. And of course there are several intermediate divisions you could use.

and	.028	in	.018	that	.014
as	.007	is	.008	the	.059
for	.007	it	.014	then	.006
had	.010	of	.023	this	.012
he	.011	on	.008	to	.031
her	.009	out	.005	was	.019
his	.006	she	.022	you	.006
if	.006				

Figure 1. This table shows the 22 most common words in my own writing and the probability of occurrence of each word. In these words we have almost one third of the words used in any of my writing. This distribution is probably similar to the distribution of words in this magazine, and in the whole body of English text.

Another breakdown of the dictionary can be by frequency of use. Some words in the English language are used significantly more often than others. For example, the word "the" is used over 200 times in this article. On the other hand, the word "narrowminded" almost didn't get used at all.

It would not be very hard to put together a list of the words with the highest probability of use. I have seen lists as large as 5000 words, but we would not have to go that far. The list in Figure 1 represents almost one third of the words I use in my writing. If this list were kept in memory and checked first, it would save one third of the disk seeks.

There are other sorts of words that either must or should be kept in memory in a spelling verifier. One of these is temporary words, that is, words that are peculiar to the document being verified. This would include proper names, such as the addressee of a letter, but it might also include abbreviations. Other choices for a word memory file are words that have already been looked up once and words that must be added to the dictionary.

Punctuation

Most punctuation is ignored, but there are two punctuation marks that must be dealt with in a spelling verifier. These are the apostrophe and the hyphen. The easiest to deal with is the apostrophe. One way to treat it is to squeeze it out of words. This would mean, for example, that "miners" and "miner's" could both be represented by the same dictionary entry. It would also mean that "couldn't" would be represented in the dictionary as "couldnt." The alternative, of course, is to consider

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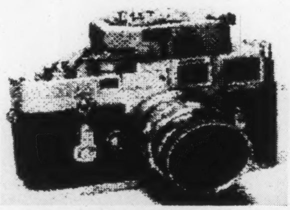

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```
10 DIM T$(127),W$(999)
20 OPEN "R",#3,"B:RWORDS",15
30 FIELD #3,15 AS W9$
40 OPEN "I",#2,"B:WORD4"
50 W1=0
60 IF EOF(2) THEN 100
70 INPUT #2,W$(W1)
80 W1=W1+1
90 GOTO 60
100 CLOSE #2
110 GET #3,1
120 W=VAL(W9$)
130 FOR I=0 TO 127
140 READ T$(I)
150 NEXT I
160 DATA *,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,
    *,*,*,*,*,*
170 DATA *,*,*,*,*,*,*,',*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,*,
    *,*,*,*,*,*
180 DATA *,a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,
    z,*,*,*,*,*
190 DATA *,a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,
    z,*,*,*,*,*
```

Figure 2. This is the set-up. First we define two arrays and fill them up. The first is T$, which is our translate table to make all letters lower case. This is filled in lines 130 to 150 from the DATA *statements in lines 160 through 190. The other array is W$. This is filled with short words from the file WORD4.*

In this code we also open the main dictionary file and retrieve the value W that is kept in its header. W is the number of the next available file entry and is used in the binary search and file update routines.

```
200 INPUT"NAME OF DOCUMENT FILE--";F$
210 OPEN "I",#1,"B:"+F$
```

Figure 3. Here we ask the name of the document and open it. Notice that there is no error checking. We can ask ourselves if we need to error check at this point. Certainly we can use all the memory space we can spare to store words and text. An error at this point is not catastrophic, so let's just skip it.

```
220 INPUT"SKIP ANY WORDS--";Q$
230 IF LEFT$(Q$,1)<>"Y" THEN 350
240 INPUT"HOW MANY PAGES--";SK
250 IF SK<1 THEN 350
260 FOR J=1 TO INT(SK*8)
270 IF EOF(1) THEN 1110
280 LINE INPUT#1,L$
290 PRINT L$
300 NEXT J
310 PRINT CHR$(7);"SKIP MORE---";CHR$(7);
320 INPUT Q$
330 IF LEFT$(Q$,1)="Y" THEN 240
340 GOTO 360
```

Figure 4. This code helps me position myself within the document. If I am checking a letter, this code is not necessary, but when I have to check a story or article, then this code is vital to allow me to check only the parts I need to check.

the apostrophe the same as any letter of the alphabet. Personally, I prefer this approach because it allows a more precise representation of words in the dictionary.

The hyphen was a bigger problem than the apostrophe because it has several meanings. One is as a minus sign. Another is to punctuate a sentence—like this. A third is to divide a word that extends over a line. A fourth is in joining words, such as "user-friendly." Only the last two of these are important in spelling verification.

The third form, dividing a word, often has a separate character code associated with it in a word processor. You can use this feature to rejoin words that have been divided by hyphens. The fourth form, on the other hand, presents a big problem.

Most words that contain a hyphen as part of the spelling, such as our example "user-friendly," are made up of roots that are valid words in their own right. As a result, if this form of the hyphen is ignored, many longer compound words can be eliminated from the dictionary. This does not apply to all words; one exception is "cul-de-sac." In other words, either way there is some problem. I prefer ignoring the hyphen used this way, because it makes it easier to ignore forms one and two.

Corrections

When a word is not found in the dictionary, it must be flagged as incorrect, and the user must be given several choices as to what to do. The possible choices are: 1) to correct the word in place; 2) to correct every occurrence of the word; 3) to add the word to the temporary dictionary for use on the rest of this document; 4) to add the word to the temporary dictionary for later inclusion in the permanent dictionary; 5) to add the word to the permanent dictionary immediately; or 6) to ignore the word. All of these choices except the last require extra coding, and thus memory space and other systems resources, to implement. For this reason, it is rare to find all of these features in the same program.

Speed And Space

This brings us to a question that has been haunting programmers and system designers for decades: What compromises should I make with speed, space and features? Since I had chosen Basic in which to write my verify program, I was faced with this problem from the very beginning. It is not that Basic is a bad language, in fact it has many advantages. Chief among its advantages is that it is widely available. Almost every personal computer comes with Basic free. Also, it has features built into it that allow for easy manipulation of string data. The disadvantages of Basic are that it is slow and it requires a great deal of overhead for string manipulation. (Of course, we never see what the overhead is.)

The program is divided into modules and presented in Figures 2 through 14.

The immediate problem was dictionary organization. The Basic I am using (Microsoft Extended Disk Basic) does not have a direct access method. On the other hand, it has more than the serial file method available. Thus, I had to write my own direct access for the alphabetized dictionary. Figure 10 shows the binary search routine used to access this file.

Additional Design Compromises

There is one important feature I have left out of this program that should be in an interactive verifier. That is the ability to make corrections in the source document file. I felt that the extra file handling and logic would make the program so slow and unwieldy as to be completely useless.

I avoid dividing words like the plague, so I have left all word divide hyphens alone. If you prefer to divide words in your typing, then you can add this feature yourself.

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```
350 IF EOF(1) THEN 870
360 W$=""
370 C$=INPUT$(1,#1)
380 C$=T$(ASC(C$))
390 IF C$="*" THEN GOTO 350
```

Figure 5. This little piece of code scans for the beginning of a word. If it does not find an alphabetic character, it loops up to line 350.

```
400 W$=W$+C$
41Q C$=INPUT$(1,#1)
420 C$=T$(ASC(C$))
430 IF C$="*" THEN 450
440 GOTO 400
450 PRINT W$;" ";
```

Figure 6. This piece of code builds the word in the work buffer, then displays it to the user.

```
460 IF LEN(W$)<2 THEN 350
465 IF LEN(W$)>15 THEN PRINT"<-LEN REJECT";:GOTO 350
470 H=W1-1:L=0:S=INT(H/2)
480 IF W$=W$(S) THEN 350
490 IF W$<W$(S) THEN H=S:S=INT((H-L)/2+L):GOTO 510
500 IF W$>W$(S)·THEN L=S:S=INT((H-L)/2+L)
510 IF H-L>1 THEN 480
520 IF W$=W$(H) THEN GOTO 350
530 IF W$=W$(L) THEN GOTO 350
540 K=L
550 IF W$(L)<W$ THEN K=H
560 IF LEN(W$)>4 THEN 740
```

Figure 7. Here we perform a binary search to see if the word is in our memory file. If it finds the word, the program will loop back to find another word. If it does not find the word, it remembers in K where the word should have been. This will allow us to add the word to the memory file later if we want to.

Notice also the trap in line 465. There are words longer than 15 characters in the English language, but I rarely use them. In fact, this trap has never been tripped.

```
570 PRINT CHR$(7);"<--- Misspelled R=record?";CHR$(7);
580 Q$=INPUT$(1)
590 PRINT Q$
600 IF Q$="Q" THEN 870
610 IF Q$<>"R" THEN 350
```

Figure 8. This is where we check to see if the user wants to record the word in the dictionary. There are two interesting things about this piece of code. The first is that we use the INPUT$ function instead of the INPUT command. To respond to this question, the user need only press one key. This is more efficient than having to press the response code and then the RETURN key. We do pay a price, though, in that it is easier for the user to press the wrong key. (Perhaps we should put more error checking here.)

The other interesting thing is that this code is not at a logical place in the flow of the program. This is because Basic does not have a convenient way to move lines. As I made changes in the logic of the program, this code stayed where I had originally put it.

```
620 IF K<>0 THEN 670
630 FOR J=W1 TO 1 STEP -1
640 W$(J)=W$(J-1)
650 NEXT J
660 GOTO 700
670 FOR J=W1 TO K STEP -1
680 W$(J)=W$(J-1)
690 NEXT J
700 W$(K)=W$
710 W1=W1+1
720 IF LEN(W$)<5 THEN T=T+1
730 GOTO 350
```

Figure 9. This is where we insert a new word into the memory file. This file originally contains the words from my dictionary that were from two to four characters long. We will store all words in this array, and if we are asked to record the new words, then we will break this array in two by word size, recording each group of words in the appropriate dictionary. (See Figures 11 through 14.)

When an apparently incorrect word is found, you have only three choices with my program. You can press R for record in temporary dictionary, Q for stop processing, or RETURN for ignore the word and proceed. When the end of the file is reached or a Q is entered, you are asked if temporary words should be recorded permanently. This allows you to add to the dictionary as the program is being run.

Building The Dictionary

Rather than sitting down with a dictionary and typing words in, I have been letting the program build the dictionary. On one system I used, we had something like 80,000 words in our dictionary. Even so, every document we verified contained some words that were missing from the dictionary. This meant to me that if I had sat down with a book like *Webster's Instant Word Guide* and typed in words, I would be putting in a great deal of effort and ending up with a dictionary that still didn't match my vocabulary. So by letting the program itself update the dictionary, I am creating a dictionary that exactly matches my vocabulary.

Of course, I have had to sit and look up a great many words before pressing R for record. You could load the dictionary faster by typing into a document the words you want to load into the dictionary, and then verifying the document. For best efficiency, batch the words in groups of about 500 and modify the program to record each word without operator intervention.

Priming The Program

To prime my program I did three things. First of all, the original program had only a memory file. This file was

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```
740 W$=W$+SPACE$(15-LEN(W$))
750 H=W-1:L=2:S=INT(H/2)
760 GET #3,S
770 IF W$=W9$ THEN GOTO 350
780 IF W$<W9$ THEN H=S:S=INT((H-L)/2+L):GOTO 800
790 IF W$>W9$ THEN L=S:S=INT((H-L)/2+L)
800 IF H-L>1 THEN 760
810 GET #3,H
820 IF W$=W9$ THEN GOTO 350
830 GET #3,L
840 IF W$=W9$ THEN GOTO 350
850 W$=LEFT$(W$,INSTR(W$+" "," ")-1)
860 GOTO 570
```

Figure 10. This is the binary search of the disk resident dictionary. Notice that it is almost identical to the binary search used on the memory file.

```
870 INPUT"RECORD TEMPORARY WORDS";Q$
880 IF LEFT$(Q$,1)="N" THEN END
890 IF T=0 THEN 960
900 OPEN "O",#2,"B:WORD4"
910 FOR I=0 TO W1-1
920 IF LEN(W$(I))>4 THEN 940
930 PRINT #2,W$(I);",";
940 NEXT I
950 CLOSE #2
```

Figure 11. This is the first part of the close routine. The program comes here when it detects an end-of-file on the document or when the user responds with a Q to the misspelled message. In this code the user is asked if the temporary words should be stored, and the short temporary words are written to disk.

```
960 K=0
970 FOR I=0 TO W1-1
980 IF LEN(W$(I))>4 THEN W$(K)=W$(I)+SPACE$(15-LEN(W$(I)
      )):K=K+1
990 NEXT I
1000 IF K=0 THEN END
1010 FOR I=K TO W1:W$(I)="":NEXT I
```

Figure 12. The second part of the close routine collects all temporary words longer than four into one place and releases the extra space.

```
1020 I=2
1030 IF I=W THEN 1170
1040 GET #3,I
1050 IF W9$<W$(0) THEN I=I+1:GOTO 1030
1060 W$=W9$
1070 LSET W9$=W$(0)
1080 PUT #3,I
1090 W$(0)=W$
1100 I=I+1
1110 FOR K2=1 TO K-1
1120 IF W$<W$(K2) THEN W$(K2-1)=W$:GOTO 1160
1130 W$(K2-1)=W$(K2)
1140 NEXT K2
1150 W$(K-1)=W$
1160 GOTO 1030
1170 K1=0
1180 FOR J=I TO I+K-1
1190 LSET W9$=W$(K1)
1200 PUT #3,J
1210 K1=K1+1
1220 NEXT J
```

Figure 13. The third part of the close routine is probably the most complicated piece of code in the program. It merges the long words from the memory file with the dictionary file on disk.

```
1230 LSET W9$=STR$(J)
1240 PUT #3,1
1250 CLOSE #3
1260 PRINT CHR$(7);"FINI";CHR$(7);J;CHR$(7)
1270 END
```

Figure 14. Finally, we write the new dictionary file length into the header record and finish. The program beeps when it is through so that the user can go do something else during the three plus minutes it takes to reorganize the dictionary file.

```
10 OPEN "I",#2,"B:WORDS"
20 OPEN "R",#1,"B:RWORDS",15
30 FIELD #1,15 AS W9$
40 OPEN "O",#3,"B:WORD4"
50 I=2
60 IF EOF(2) THEN 130
70 INPUT #2,W$
80 IF LEN(W$)<5 THEN PRINT #3,W$;",";:GOTO 60
90 LSET W9$=W$
100 PUT #1,I
110 I=I+1
120 GOTO 60
130 LSET W9$=STR$(I)
140 PUT #1,1
```

Figure 15. This program is run to brake a memory file image into a new memory file image of short words and a random disk file of long words for my spelling verify program.

loaded and saved on disk into a file called WORDS. To start, I created the file WORDS with my text editor to contain the words in Figure 1. After this file had grown to about 1000 words, the memory file was too unwieldy to use. At this point I added the coding for the disk file to my program and ran the program in Figure 15 to initialize it.

Additional Comments

There is one significant fault with this verifier. It is slower than the other interactive verifiers that I have used. I could probably have gotten more performance out of the program if I had coded it in some other language. It is true that I do have more time than money, but I would rather put up with the small amount of slowness in this program than try to debug a PL/I version, for example.

An interactive spelling verify program has only limited application, primarily because you have to sit there while it is running. (This is a problem with *fast* interactive spelling verifiers also.)

Furthermore, there are several spelling mistakes that this kind of program will not catch. I have already started thinking about what the next refinement to this program should be. The problem statement is: without going into artificial intelligence or syntactical analysis, devise a program that will aid in the detection of homonym errors. Examples of homonyms are: die and dye; there and there; whey, way, and weigh. I'll start on it as soon as I've weeded the garden and cleaned the garage. ☐

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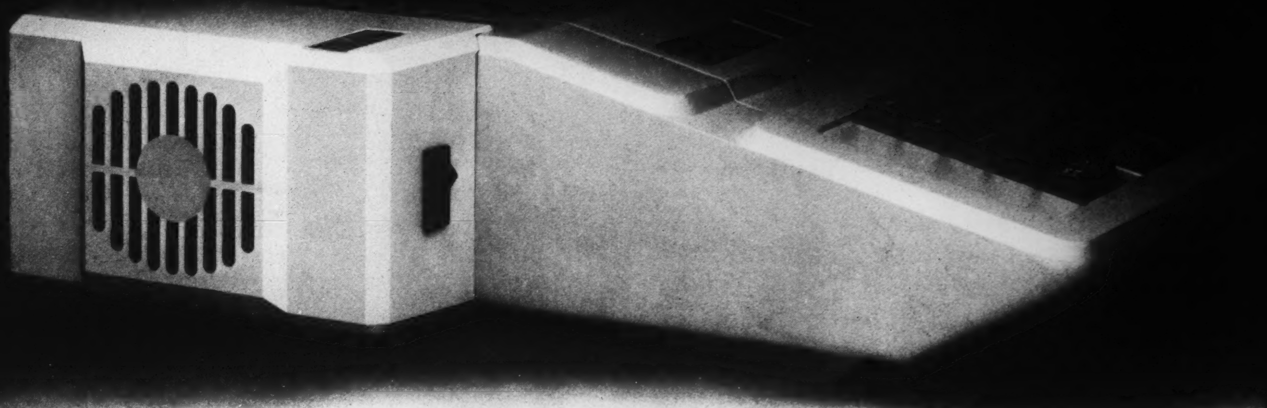

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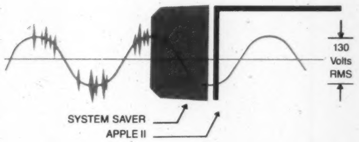

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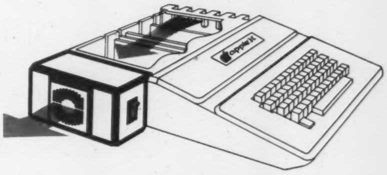

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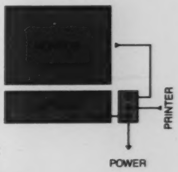

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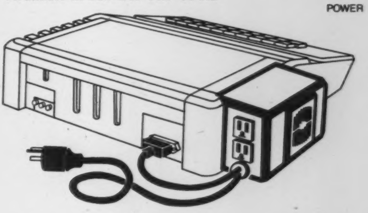

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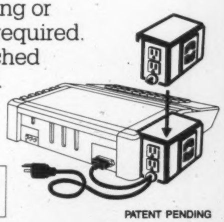

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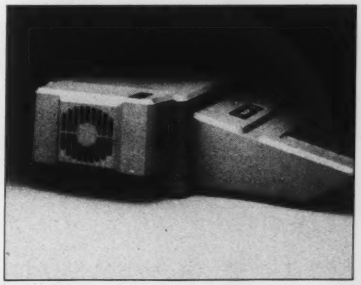

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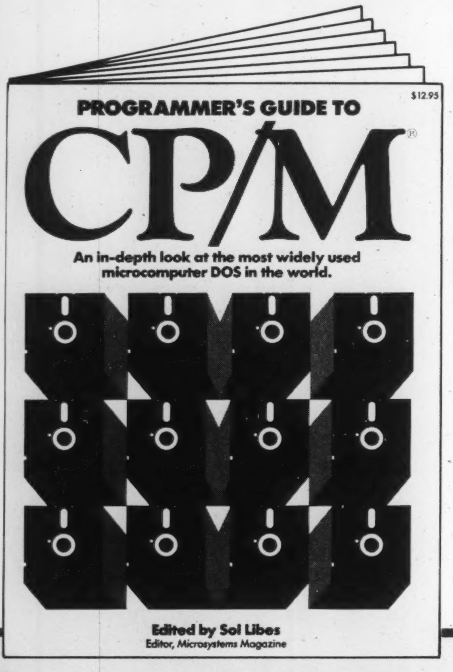
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```
10   REM
20   REM  **********************
30   REM  TYPEWRITER WILL HELP
32   REM  YOU IN YOUR EFFORTS TO
34   REM  BECOME A TOUCH TYPIST
40   REM  **********************
50   REM
70   HOME
90   INPUT "WHAT IS YOUR TYPING SP
      EED ?";SP
100   PRINT : PRINT "IF YOU WANT N
      UMBERS, LETTERS AND FUNC-   T
      UATION, TYPE 33": PRINT : INPUT
      "FOR LETTERS ONLY, TYPE 65
      ";B
110   HOME
130 X =  RND (1):X = X * 100:X =
       INT (X)
140   IF X < B THEN 130
150   IF X > 90 THEN 130
160   PRINT  CHR$ (X);" ";
170   GET W$
180   IF W$ <  >  CHR$ (X) THEN  LET
      M = M + 1: PRINT : HTAB 7: PRINT
      "MISTAKE NUMBER ";M;" WAS ";
      W$
190   IF M < 10 THEN 210
200   IF M / 10 =  INT (M / 10) THEN
       PRINT "FOR A ";SP;" WPM TYP
      IST, YOU SURE MAKE A LOT OF
      MISTAKES": PRINT
210   GOTO 130
```

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Conversions Are Downhill With Upgrade

Gary Grout

If you upgrade your TRS-80 from cassette to disk, you may soon discover a software problem: your old Level II Basic programs won't run on your new disk system. The disk operating system (DOS) overlays Level II Basic programs, effectively erasing them because disk Basic resides higher in memory than does Level II Basic.

Those old Level II programs, good as they are, just won't work. And with this discovery, a disheartening image appears; you see yourself keying in your entire software library again—hours and hours of your time lost.

Unless you have a conversion program like Upgrade.

Upgrade is an assembly language program that moves Level II programs up in memory, resets the line pointers, and allows your old programs to run in disk Basic.

Operating Instructions

If you have an editor/assembler, compile the program and save it on disk. (We'll discuss the assembly language listing later.)

To convert one of your old Level II programs, first load Upgrade into memory while in DOS. With the program successfully loaded, hold down the BREAK key and reset the computer. This transfers you to Level II Basic. Don't worry; the converter program is still in memory and has not been lost.

Next, load your Basic program from tape as you normally do. When READY appears, type SYSTEM and answer the prompt *? by typing /65184. This sets Upgrade into operation; your Level II program is moved into high memory, and the line pointers are reset. You have now moved the old program out of the way so that when you call the disk operating system back, it won't step all over your Level II program.

The next thing to do is reboot (press reset) and return to DOS. When the DOS READY appears type BASIC. Once in disk Basic, you type SYSTEM, but this time when you see *?, you enter /65382. Your old Level II program moves down into the disk Basic area, and the pointers are reset. You can now save your old program on disk, and it will work just like new.

Don't run the converted Basic program before you save it or you will get an error message.

If you don't have an editor/assembler to compile the assembly language program, you can use the Basic program in Listing 1. In disk Basic, type the program as shown. Then you may save it on disk by rebooting and using a DUMP command typed exactly as follows (including the spaces):

```
Model III: DUMP UPGRADE (START=
0FEA0,END=0FF80)
Model I:  DUMP UPGRADE (START=
X'FEA0',END=X'FF80')
```

In disk Basic, you load and run this Basic program. Then you reset while holding down the BREAK key to transfer to Level II Basic. At this point you load your taped program and perform the procedure described earlier.

The Assembly Language Program

The assembly language conversion program loads at FEA0H which means you will need 48K of memory (BFEAH for 32K). See Listing 2.

The program begins by resetting the line pointers. The first two bytes of every Basic program line contain the address where the next Basic line starts. The two bytes are referred to as a pointer. These addresses must be changed if the program is to be moved up in memory. The code between the labels RENUM and DONE, lines 140 to 300, resets the pointers.

Resetting the pointers is like rebuilding stairs from the bottom up. You fix the first stair, step on it, and use it to fix the next. With line pointers, you get the first address, save it for later reference, fix it by adding an offset, and replace it in the original memory address. You then retrieve the old address you saved, go to that location in memory to find the next pointer, and repeat the process of adding an offset.

The offset is the number of bytes difference between where Level II Basic loads and where disk Basic loads in memory. For the Model I the offset is 273BH and for the Model III, 25F0H.

The only other thing the renumbering routine must do is check for the end of the Basic program. A Basic program

---

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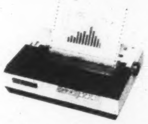

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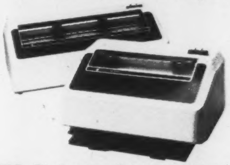

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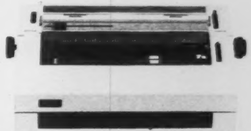

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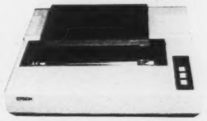

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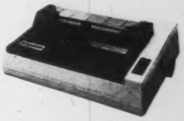

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ends when the two bytes of a line pointer contain zeros. So the renumbering routine works by checking the line pointer for zeros, renumbering the line pointer by adding an offset, and then going to the next line pointer.

Looking at the assembly language listing, you'll see the line pointer is first loaded into the IX register in line 130. A check is then made to determine if it is the end of the program. The check is performed by transferring the line pointer into the DE register, loading D into A register, and then using the OR statement in line 170. The zero flag will be set only if both D and E are zeros. When the end of the program is reached, we branch from line 180 to 300 labeled DONE.

If the no zero flag is set, then we simply move the line pointer from DE to HL and add the offset contained in BC. HL is then replaced in the original Basic program memory location, and the process begins again with the next line pointer whose address is in DE.

After resetting the pointers, we must move the program to high memory. This is done with a block move. To do a block move you must know the start of the memory section to be moved, the destination address to which it will be moved, and the number of bytes of information to move.

In this case the start of the memory section is 42E9H, the start of Level II Basic. This is stored in the HL register. The destination address is 82E9H (my favorite number above 16K Level II) which is stored in the DE register.

Finally, we must compute the number of bytes to move. We do this by subtracting the start of the program from the end of the program. The start is 42E9H, and son of a gun, the end of the program is still in the IX register after we reset the pointers. So from the label DONE in line 300 to line 380 we do the subtraction and store the result (the length of the program) with the label LEN. Now that we have all the information we need, the program performs the block move.

After the move, the program prints instructions on the screen and falls into an infinite loop awaiting instructions.

Next, you return to disk Basic. All that is left is to move the program down to the proper memory location again. How will we do this? Another block move.

This time, the start of the memory section to be moved is 82E9H. The destination is taken from the start of Basic, vector 40A4H. The length of the program is retrieved from LEN. With 82E9H in HL, 6A24H or 6AD9H in DE (depending on whether you have Model I or Model III respectively), and the length of the program in BC, the move is performed again.

Last, we must set the end of the Basic program in memory location 40F9H. And again, the address is still in the HL register after the block move, easy to find and use.

Completing The Conversion

Before you get too excited about all the typing you have saved yourself, you should know that some Level II statements won't run in disk Basic. For example, USR statements in Level II have the form A=USR(0). Disk Basic has expanded the number of USR routines to ten. Because of this expansion, the syntax has changed to A=USR1(0), with a number following the USR in the statement. Where before Level II POKED the start of the USR routine into memory, disk Basic defines the start with a statement such as DEFUSR1=&HFEA0. You will have to add or modify these statements accordingly.

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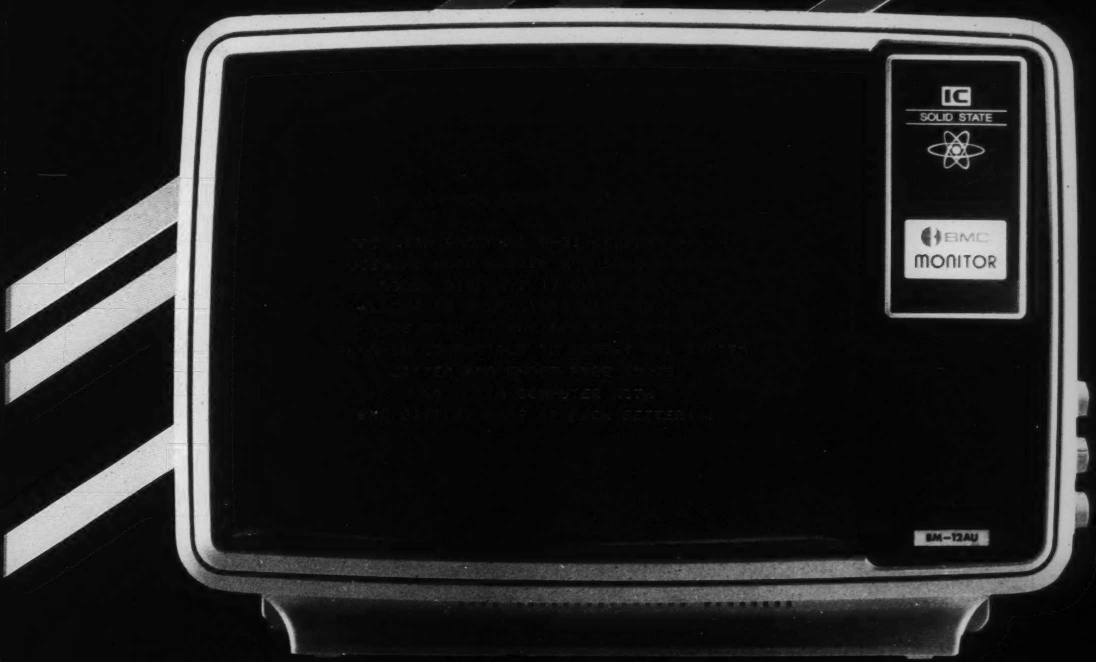

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CIRCLE 125 ON READER SERVICE CARD

Conversions, continued...

Listing 1. Upgrade Basic program for 48K.

```
10 CLEAR 5000
20 FOR X=-352 TO -128
30 READ A
40 POKE X,A
50 NEXT
55 END
60 DATA 205,201,1,175,221,33,233,67,221,94
70 DATA 0,221,86,1,122,179,202,198,254,1
80 DATA 59,39: REM MODEL III USES 240,36
90 DATA 213,225,9,221,117,0,221,116
100 DATA 1,213,221,225,175,195,168,254,221,35
110 DATA 221,229,225,17,233,67,237
120 DATA 82,35,229,193,237,67,100,255,33,233,67
130 DATA 17,233,130,237,176,33,241,254,126,183
140 DATA 40,8,229,205,51,0,225,35
150 DATA 24,244,195,238,254,84,72,69,32,66,65
160 DATA 83,73,67,32,80,82,79,71,82,65,77,32,72
170 DATA 65,83,32,66,69,69,78
180 DATA 32,77,79,86,69,68,32,84,79,32,72,73,71
190 DATA 72,32,77,69,77,79,82,89,13,82,69,66,79,79
200 DATA 84,13,71,79,84,79
210 DATA 32,66,65,83,73,67,32,13,84,89,80,69,32
220 DATA 83,89,83,84,69,77,13,84,72,69,78,32
230 DATA 69,78,84,69,82,32,47,32
240 DATA 54,53,51,56,50,32,84,79,32,84,72,69,32
250 DATA 80,82,79,77,80,84,32,42,63,0,0,0
260 DATA 33,233,130,237,91,164,64,237
265 DATA 75,100,255,237,176,235,0,0,34,249,64
270 DATA 42,232,64,249,175,195,25,26
```

Listing 3. Upgrade Basic program for 32K.

```
10 CLEAR 5000
20 FOR X=-16736 TO -16512
30 READ A
40 POKE X,A
50 NEXT
55 END
60 DATA 205,201,1,175,221,33,233,67,221,94
70 DATA 0,221,86,1,122,179,202,198,254,1
80 DATA 59,39: REM MODEL III USES 240,36
90 DATA 213,225,9,221,117,0,221,116
100 DATA 1,213,221,225,175,195,168,254,221,35
110 DATA 221,229,225,17,233,67,237
120 DATA 82,35,229,193,237,67,100,255,33,233,67
130 DATA 17,233,130,237,176,33,241,254,126,183
140 DATA 40,8,229,205,51,0,225,35
150 DATA 24,244,195,238,254,84,72,69,32,66,65
160 DATA 83,73,67,32,80,82,79,71,82,65,77,32,72
170 DATA 65,83,32,66,69,69,78
180 DATA 32,77,79,86,69,68,32,84,79,32,72,73,71
190 DATA 72,32,77,69,77,79,82,89,13,82,69,66,79,79
200 DATA 84,13,71,79,84,79
210 DATA 32,66,65,83,73,67,32,13,84,89,80,69,32
220 DATA 83,89,83,84,69,77,13,84,72,69,78,32
230 DATA 69,78,84,69,82,32,47,32
240 DATA 54,53,51,56,50,32,84,79,32,84,72,69,32
250 DATA 80,82,79,77,80,84,32,42,63,0,0,0
260 DATA 33,233,130,237,91,164,64,237
265 DATA 75,100,255,237,176,235,0,0,34,249,64
270 DATA 42,232,64,249,175,195,25,26
```

You should also check the POKE statements. If any of these uses an address between 42E9H and 6A24H, it may interfere with the disk operating system. You should probably check any POKE statements that use high memory as well. Because disk Basic is higher in memory than Level II Basic, your old machine language routines may be overwritten by the disk Basic program. Pray they aren't, because you may then have to reassemble them with a new origin.

It is my assumption that with 16K dynamic RAM chips selling below $20 a set you probably have 48K of usable memory. If not, here is one other caution. If your memory is limited to 32K and you assemble Upgrade to fit your computer, your Basic program must not totally use up 16K of Level II Basic. Otherwise the block move will overlay Upgrade and you won't be able to move the Basic program back down in memory. With 48K, however, Upgrade won't be touched. Listing 3 is the Basic program for 32K. To store it on disk, execute the dump command:

```
DUMP UPGRADE (START=0BEA0,
END=0BF80)
```

I hope this program will help you with your expanded computer system. I am sure that when you bought your disk drive you were probably not concerned with the upward compatibility of programs and may not have anticipated what the conflict between Level II Basic and Disk Basic really meant—hours of retyping. Now that you have Upgrade, however, you have plenty of spare time to devote to mowing the lawn, shopping, fixing the car, doing the laundry . . . ☐

Listing 2. Upgrade assembly language listing.

```
FEA0            00100           ORG       0FEA0H
FEA0 CDC901     00110 START CALL      1C9H                    ;CLEAR SCREEN
FEA3 AF         00120           XOR       A                       ;CLEAR A REG.
FEA4 DD21E942   00130           LD        IX,42E9H                ;START OF BASIC
                                                                  ; MODEL III USES 43E9H
FEA8 DD5E00     00140 RENUM LD        E,(IX+00H)              ;LSB TO E REG.
FEAB DD5601     00150           LD        D,(IX+1H)               ;MSB TO D REG
FEAE 7A         00160           LD        A,D                     ;TEST DE FOR 0
FEAF B3         00170           OR        E
FEB0 CAC6FE     00180           JP        Z,DONE
FEB3 013B27     00190           LD        BC,273BH                ;OFFSET FOR MODEL I
BASIC
                00200                                             ; MODEL III USES 24F0H
FEB6 D5         00210           PUSH      DE                      ;SAVE NEXT LINE ADDR
FEB7 E1         00220           POP       HL                      ;MOVE IT TO LHL
FEB8 09         00230           ADD       HL,BC                   ;ADD THE OFFSET
FEB9 DD7500     00240           LD        (IX+00H),L              ;REPLACE IT IN MEM PTR
FEBC DD7401     00250           LD        (IX+1),H                ;
FEBF D5         00260           PUSH      DE                      ;NEXT LINE PTR BECOMES
FEC0 DDE1       00270           POP       IX                      ;NEXT LINE ADDRESS
FEC2 AF         00280           XOR       A                       ;CLEAR REG
FEC3 C3A8FE     00290           JP        RENUM
FEC6 DD23       00300 DONE  INC       IX                      ;IX HOLDS TOP OF PROG
ADDR
FEC8 DDE5       00310           PUSH      IX                      ;MOVE IT TO
FECA E1         00320           POP       HL                      ;HL
FECB 11E942     00330           LD        DE,42E9H                ;START OF LEVEL II
BASIC
FECE ED52       00340           SBC       HL,DE                   ;GET NMBR OF BYTES TO
MOVE
FED0 23         00350           INC       HL                      ;ADD ONE
FED1 E5         00360           PUSH      HL                      ;SAVE IT
FED2 C1         00370           POP       BC                      ;PUT IT IN BC
FED3 ED4364FF   00380           LD        (LEN),BC                ;STORE IT TO
FED7 21E942     00390           LD        HL,42E9H                ;START TO BASIC
FEDA 11E982     00400           LD        DE,82E9H                ;DESTINATION OF PROG
MOVE
FEDD EDB0       00410           LDIR                              ;MOVE PROG UP TO 82E9H
FEDF 21F1FE     00420           LD        HL,MSG                  ;PUT MESSAGE ADDR IN
HL
FEE2 7E         00430 PRINT LD        A,(HL)                  ;GET NEXT CHAR
FEE3 B7         00440           OR        A                       ; TEST FOR END OF
MESSAGE
FEE4 2808       00450           JR        Z,LOOP                  ;GO IF DONE
FEE6 E5         00460           PUSH      HL                      ;SAVE HL
FEE7 CD3300     00470           CALL      33H                     ;DISPLAY CHARACTER
FEEA E1         00480           POP       HL                      ;RETORE HL
FEEB 23         00490           INC       HL                      ;UPDATE IT
FEEC 18F4       00500           JR        PRINT                   ;LOOP TILL DONE
FEEE C3EEFE     00510 LOOP  JP        LOOP                    ;LOOP UNTIL REBOOT
```

```
FEF1 54         00520 MSG    DEFM     'THE BASIC PROGRAM HAS BEEN MOVED TO
HIGH MEMORY'
FF20 0D         00525        DEFB     13
FF21 52         00530        DEFM     'REBOOT'
FF27 0D         00535        DEFB     13
FF28 47         00540        DEFM     'GO TO BASIC
FF33 0D         00545        DEFB     13
FF34 54         00550        DEFM     'TYPE SYSTEM'
FF3F 0D         00555        DEFB     13
FF40 54         00560        DEFM     'THEN ENTER /65382 AT THE PROMPT *?'
FF63 00         00570        DEFB     0
FF64 0000       00580 LEN    DEFW     0000                ;STORAGE FOR PROG LEN
FF66 21E982     00590 DOWN   LD       HL,82E9H            ;PROG START
FF69 ED5BA440 00600          LD       DE,(40A4H)          ;PROG DESTINATION
(START OF BASIC)'
FF6D ED4B64FF 00610          LD       BC,(LEN)            ;LENGTH OF PROG
FF71 EDB0       00620        LDIR                         ;MOVE IT DOWN
FF73 EB         00630        EX       DE,HL
FF74 00         00640        NOP
FF75 00         00650        NOP
FF76 22F940     00660        LD       (40F9H), HL         ;STORE PROG END IN PTR
FF79 2AE840     00670        LD       HL, (40E8H)        GET STACKED PTR
FF7C F9         00680        LD       SP,HL               ;RESTORE THE STACK
FF7D AF         00690        XOR      A                   ;CLEAR A REG.
FF7E C3191A     00700        JP       1A19H               ;GO TO BASIC
FEA0            00710        END      START

DOWN    FF66
LOOP    FEEE
PRINT   FEE2
MSG     FEF1
LEN     FF64
DONE    FEC6
RENUM   FEA8
START   FEA0
```

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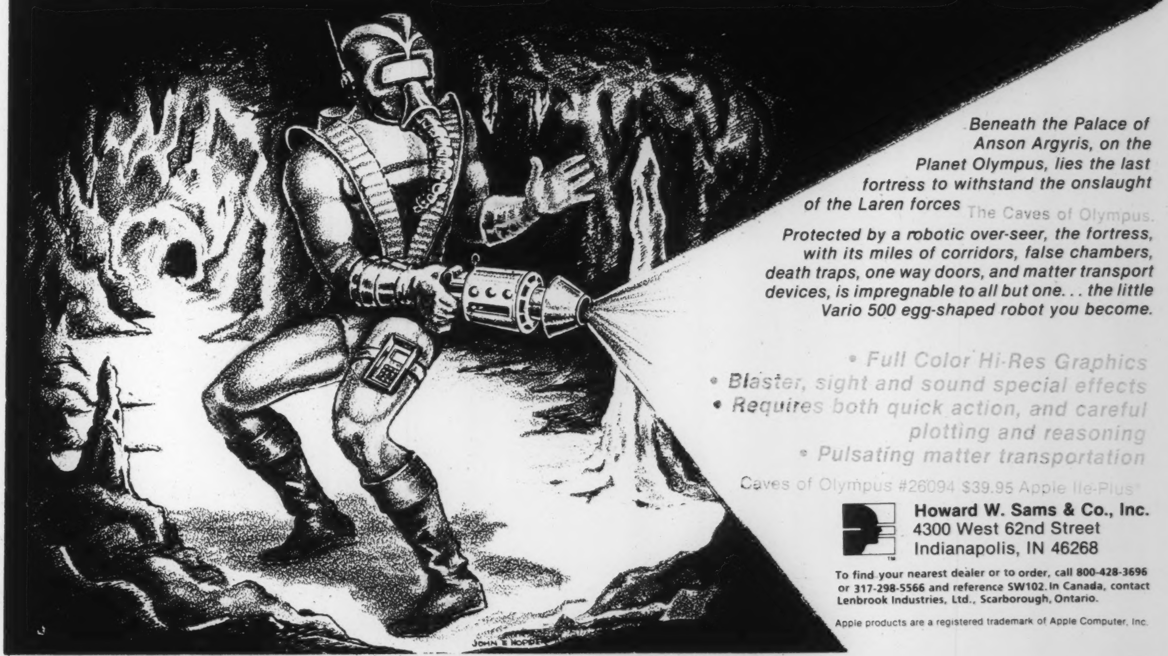

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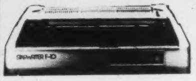

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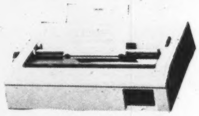

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A Program To Trace Variables In Basic Programs

Robert Milazzo

Have you ever searched through a program looking for a variable? Have you ever deleted a line only to find that 87 GOTOs in your program then had to be sent somewhere else? If you believe you were meant for better things than tracing jumps and variables in your programs, read on.

I wrote Trace to solve both of the above problems. Trace is a Basic program that will trace any variable and print out on the display each and every line in which it occurs. Trace also has the ability to find every GOSUB, GOTO, IF-THEN, RESUME, and ELSE statement that jumps to a particular line.

Programs written in Basic have many advantages. They are easy to understand and, more important, easy to modify. Unfortunately, Basic has a well deserved reputation for being very, very slow. Trace will take between forty seconds and one minute to find all the lines in which a particular variable is located in a 5K program. This still beats listing the program and looking through all those multiple statement lines.

Running The Program

This program contains no frills or fancy displays. Every single convenience has been left out in the interest of speed and memory requirements. The reward for this is that Trace uses fewer than 800 bytes. Using Trace is very easy. Just follow these simple instructions:

1. CLOAD the program you want to trace through.
2. In the command mode enter the program in Listing 2.
3. CLOAD "Trace".
4. POKE 16548, 233: POKE 16549,67 (Model 1, POKE 16549,66).

Now when you list the program you will find that both programs have been linked together. This technique can also be used on other programs that you want to merge.

Just type in RUN 65000 and you are off. The program will then ask you to enter the variable or line you wish to trace. If you want to trace variable A1, for example, type in A1. If you want to find all the lines that jump to line 1000, then enter 1000.

Tracing subscripted variables is done in a special way. Type in A(to find the array called A. The left parenthesis is

Listing 1.

```
65000 CLS:DEFINTA,N,C,B:N=17384:GOSUB65200
65010 INPUT"ENTER VARIABLE OR LINE";D$:PRINT
65020 PRINT"REFERENCES TO ";D$;" OCCUR IN THESE LINES":PRINT
65030 FORN=17389TO32767:A=PEEK(N):IFA=0ORA=136ORA=147THENGOSUB 65190
65040 IFA=34GOSUB65180
65050 IFA=ASC(D$)Z$="":B=1:GOSUB65070
65060 NEXT
65070 IFA<91ANDA>64THEN65110
65080 S=N
65090 S=S-1:D=PEEK(S):IFD=32GOTO65090
65100 IFD<>141ANDD<>145ANDD<>149ANDD<>159ANDD<>202RETURN
65110 IFPEEK(N-1)<91ANDPEEK(N-1)>64RETURN
65120 Z$=Z$+CHR$(A):IFZ$=D$GOTO65150
65130 IFZ$><LEFT$(D$,B):N=N-1:RETURN
65140 B=B+1:N=N+1:A=PEEK(N):IFA=40THEN65170ELSE65120
65150 A=PEEK(N+1):IFA<91ANDA>64ORA=35ORA=37ORA=33RETURN
65160 IF(A>47ANDA<58)ORA=36ORA=40RETURN
65170 PRINT"<"LI">";:GOSUB65190:RETURN
65180 N=N+1:A=PEEK(N):IFA<>34GOTO65180ELSERETURN
65190 N=PO-1
65200 PO=PEEK(N+1)+PEEK(N+2)*256
65210 LI=PEEK(N+3)+PEEK(N+4)*256:IFLI=65000ENDELSEN=N+4
65220 RETURN
```

Listing 2.

```
A=PEEK(16633)+PEEK(16634)*256-2:POKE(16548,A-INT(A/256)*256): POKE
(16549,INT(A/256)*256)
```

Robert Milazzo, 3604 Lighthouse Avenue, Las Vegas, NV 89110.

important because it tells the program that it is looking for an array.

Understanding The Program

This program makes use of the way Basic stores programs in memory. Figure 1 shows how a short program is stored.

The start of the program storage area in the Model III is location 17385. Locations 17385 and 17386 contain the address of the beginning of the next line. This can be checked by multiplying the contents of 17386 by 256 and adding the result to the contents of location 17385.

The next two bytes (locations 17387 and 17388) represent the line number again in least significant followed by most significant byte format.

Location 17397 contains a zero: This marks the end of every line of a Basic program. In this case, it marks the end of line 10.

Hopefully, you can now see why every line has an overhead of five bytes. Two are needed as pointers to the next line, two are used to contain the line number, and one is needed to mark the end of the line. This is the reason multiple statement lines are used to save space.

The actual program data for line 10 begins at location 17389 and ends at location 17396. It is this part of the program with which we are most concerned. The first byte is a 129 and represents the Basic command FOR. All of the Basic commands are tokenized in this manner to save memory. The next byte is a 78, which stands for the variable N.

Figure 1.

```
10 For N=1To100
20 Print N
30 Next
```

Storage Of The Above Program In Memory

Location	Contents
17385	246
17386	67
17387	10
17388	0
71389	129
17390	78
17391	213
17392	49
17393	189
17394	49
17395	48
17396	48
17397	0
17398	253

All Basic variables and numbers are stored in ASCII formats. The following 213 is another token that represents the equal sign. The 49 is the ASCII representation of the number 1. The following 189 is the token for the Basic command TO. The next three locations contain the ASCII representation of the number 100.

Armed with this knowledge, to find the variable B in a program, all you have to do is search through memory until an ASCII 66 is found. To find a GOTO 100 statement, all that is required is to find four consecutive bytes that equal 141, 49, 48 and 48. It is a little bit more complicated than this, but I think you can get the idea.

The Logic Of The Program

Trace has been written in a compressed format that undoubtedly makes the program harder to read. In return for the confusion, the program runs faster and uses less memory. I hope that the following comments can help clear up some of the confusion.

Lines 65000-65020 are simple enough. They clear the screen, set up the main program variables as integers, and prompt you to enter the target string. Defining as many variables as possible as integers definitely speeds things up. This is almost always true and should be kept in mind when writing your own programs.

Lines 65030-65060 are the main program loop. Each location starting with 17389 is checked, and its contents stored in the A variable. If the token that represents a DATA statement, or a REM, or simply a zero is discovered, then control passes to the subroutine at 65190. This is done to prevent the program from searching through lines in which variables or jumps can't possibly be found. If a quote is found, control passes to the subroutine at 65180. Again this is done to prevent the program from doing any work on the data that are enclosed by quotes.

Variable List

A	Value stored in location N
B	Position of D$ undergoing testing
D	Value stored in location S
N	Memory location currently being tested
S	Memory location being examined for a jump statement
LI	Current line number being worked on
PO	Address of the beginning of the next line
D$	Inputted line number or variable
Z$	String being formed for comparison with D$

Line 65050 tests whether or not a match has been found between the first character of D$ and the current memory location. If a match is found, then further testing begins at line 65070. If a match is not found, then the next location is tested.

Line 65070 tests whether the character is alphabetic or numerical. If the character is alphabetic, then the program jumps to line 65110. If it is numerical, then control drops to the next line in the program.

Lines 65080-65100 backspace through memory searching for the token that represents one of the jump statements. All spaces are ignored in line 65090. Five Basic keywords are scanned for. They are GOTO, GOSUB, RESUME, THEN and ELSE. If one of these tokens is not found, control passes back to the main loop.

Lines 65110-65170 comprise the main comparison loop. The contents of each successive memory location are converted to a string and added together to form Z$. If Z$ equals D$, then the required variable or jump has been found. If the two strings are found to be unequal, control passes back to the main loop.

Line 65180 is the subroutine responsible for skipping through all the string data that are enclosed by quotation marks.

Lines 65190-65210 keep updating the line pointers and the current line number being searched.

Line 65000 marks the end of the target program, and program operation ceases.

Modifications And Precautions

This program is very easy to use and to modify. A list of all the variables used in the program is provided so that you will be able to find your way around. Model I owners should change the 17389 in line 65030 to 17133. If the display is not to your liking, modify line 65170 until you are pleased. You can adjust the program to trace through only part of a program by putting the appropriate line number in line 65210.

I have run this program many times and haven't had any problems. If a problem does come up, check the listing or, better yet, run the target program before tracing. This will help weed out any syntax errors such as open quotes. Trace is very sensitive to this particular error in the target program and will react unreliably if one is found. ☐

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CIRCLE 192 ON READER SERVICE CARD

A Program To Locate Heavenly Bodies

Star Gazing

James A. Ingram

Whether you're a dyed-in-the-wool amateur astronomer or you can't tell a nebula from a noodle, the following programs (written in Microsoft Basic) should provide many hours of enjoyment. The first is designed to tell you what stars are visible on a given night and where they are located. The second is an interactive version to use with a telescope. I originally wrote them to help position my small field telescope, which doesn't have a clock drive mounting system for tracking stars. I discovered later that the programs make it super easy for the novice to locate stars and constellations, too. My ninth grade students give them a thorough workout every fall!

Star position is best described by using right ascension and declination. These are the astronomer's grid system, similar to latitude and longitude. The trouble the average person has in making any sense of them is due to the fact that he is stationary with reference to the stars, while the earth spins on its axis and revolves around the sun. The effect of this is that we have a slightly different view of the sky every night. Each six months we see the opposite half of the sky.

What we need is a grid system that is fastened to the ground where we are standing. The system of compass bearing and altitude is probably the simplest and best known. North is a compass bearing of zero, while east, south, and west are 90°, 180°, and 270° respectively. Full circle brings you to 360°, at the starting point of zero. Altitude measures the angular height straight up from the horizon in degrees; the horizon is zero and straight overhead is 90° (called the *zenith*). An object at a compass bearing of 135° and altitude of 45° would be halfway between the horizon and overhead to the southeast.

The trick is to relate these two coordinate systems, one moving and one stationary, one tilted at an angle to the other. For the average mathematics professor, this is a piece of cake, but for the rest of us it poses a long and difficult problem. Enter the computer.

If we load the computer with a list of stars and their coordinates, we can let it decide what is visible on a given night and calculate the bearing and altitude. The first step is to freeze any motion, and for that reason the data is calculated only for a specific date and time of night. Next, the coordinates are mathematically rotated to your local horizon. Finally, the information is printed in a table. The calculations to perform all of this generate some other information useful to the astronomer and these data are included in the table.

Using The Program

In the first of the two Microsoft Basic programs, you are asked to enter the date and time. Enter both numbers as a five-character string such as 01/22 or 18:30. Note that numbers must be two-digit and that the time is entered in 24-hour format. The program will accept any value to the nearest day or minute. Your entries are not checked to see if they are "real."

Next, you are asked whether you are on standard time or daylight saving time (since the sky rotates 15° every hour, this can make quite a difference in accuracy). Enter S for standard or D for daylight.

Last, you are asked for a lower limit of brightness to be included in the table. Astronomers call this *magnitude*; the larger the number, the dimmer the star. The brightest stars in the night sky are usually about zero or one, while the dimmest visible with the unaided eye are about five or six. For a table of bright stars only, enter a one or two; if you want everything, enter a magnitude of about 15.

After you enter the brightness limit, the computer takes over the work. First it prints a table heading with the date, the number of days that have elapsed from the first day of fall (the *autumnal equinox*), the time in three formats, your location in latitude and longitude, the brightness limit, and the position of due south in right ascension coordinates. It then begins searching through the data table, testing each item to see if it is above your horizon and if it is bright enough to include in the table. If it is, the program finishes the calculations and adds the item to the printed copy. The final table shows the name of the star, its brightness, its right ascension and declination, and its bearing and altitude.

James A. Ingram, 804 North Center St., Broken Bow, NE 68822.

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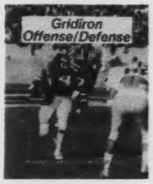
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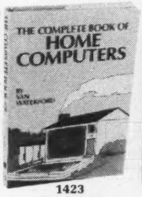
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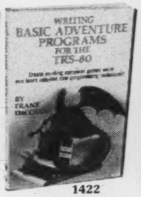
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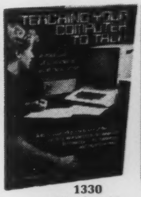
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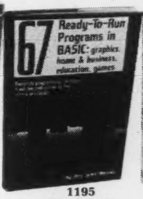
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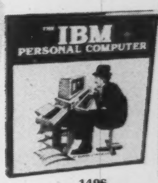
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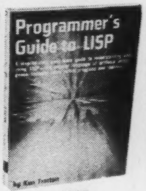
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CIRCLE 133 ON READER SERVICE CARD

Star Gazing, continued...

With list in hand, head for the nearest open field at the appointed time. Establish where north lies (from the North Star, not by compass), then measure off the bearing and altitude of the first star on the list. You should be able to find it on the first try. To measure the angles you can make an instrument called an *astrolabe* for accuracy, or you can use a system of hand measures. Holding your hand at arm's length against the sky, the width of your little finger is about one degree; your pointer, middle, and ring fingers together measure about five degrees; your closed fist measures about 10 degrees, and the distance from your pointer to your little finger when spread apart (until it hurts!) is about 15 degrees. Use both hands, and you can work your way around the horizon and up into the sky to the correct location. Just remember, the sky will be turning slowly while you gaze—after an hour or so, stars in the south and overhead will be visibly farther west than your table coordinates show.

The program is well documented with remark statements; by deleting them you may be able to pare down memory requirements. The data statements are arranged with name (string), magnitude (numeric), right ascension (string), and declination (numeric). You can add more, or shorten the table as long as you remember to change statement 265 to the new data table length. Be sure to enter your own latitude and longitude at lines 160 and 165. The value at line 170 corrects your local zone time to Greenwich time; the correct values for the continental United States are as follows: EST,19; CST,18; MST,17; PST,16.

I have included stars, nebulae, clusters, and other objects of interest in the data table, but it may not suit your interests. You may want to enter the coordinates of the centers of major constellations, for instance. In any case, such information should be available at your public library in the astronomy section.

The second program is simply a bearing and altitude calculator. To use it, enter the date and time as before. To locate a given star, look up its right ascension and declination in a star atlas and enter the values into the computer. The CRT display will show some useful values and the bearing and altitude of the star in question.

You may enter data for several stars without having to re-enter the date each time; just respond Y to the question ANOTHER STAR (Y/N)? Typing an N stops execution.

The next big project will be to develop a program to locate the moon and planets on any given night. Any suggestions? What ever happens, the results should be far out. □

Sample run of STARS.

```
*****************************************************************
**                  TABLE OF VISIBLE SKY OBJECTS               **
**      THIS PROGRAM CHECKS THROUGH A MASTER TABLE CONTAINING STARS AND OTHER **
** INTERESTING OBJECTS IN THE NIGHT SKY, AND DETERMINES WHICH ONES ARE VIS-   **
** IBLE AT A SPECIFIC TIME AND DATE.  IT THEN CALCULATES THE COMPASS BEARING  **
** AND ALTITUDE ABOVE THE HORIZON FOR THAT TIME.  THE TABLE  INCLUDES THE     **
** NAME, MAGNITUDE, RIGHT ASCENSION, DECLINATION, BEARING, AND ALTITUDE. NOTE **
** THAT TIME MUST BE ENTERED IN 24 HOUR FORMAT (2:00 PM = 14:00) AND THAT     **
** NUMBERS LESS THAN 10 MUST BE ENTERED AS 2 DIGITS WITH A LEADING ZERO (05). **
*****************************************************************

DATE (MM/DD) : ? 01/14
TIME (24 HR. CLOCK) HH:MM : ? 22:00
STANDARD TIME (S) OR DAYLIGHT (D) ? S
MAXIMUM MAGNITUDE (MIN. BRIGHTNESS) FOR TABLE? 1

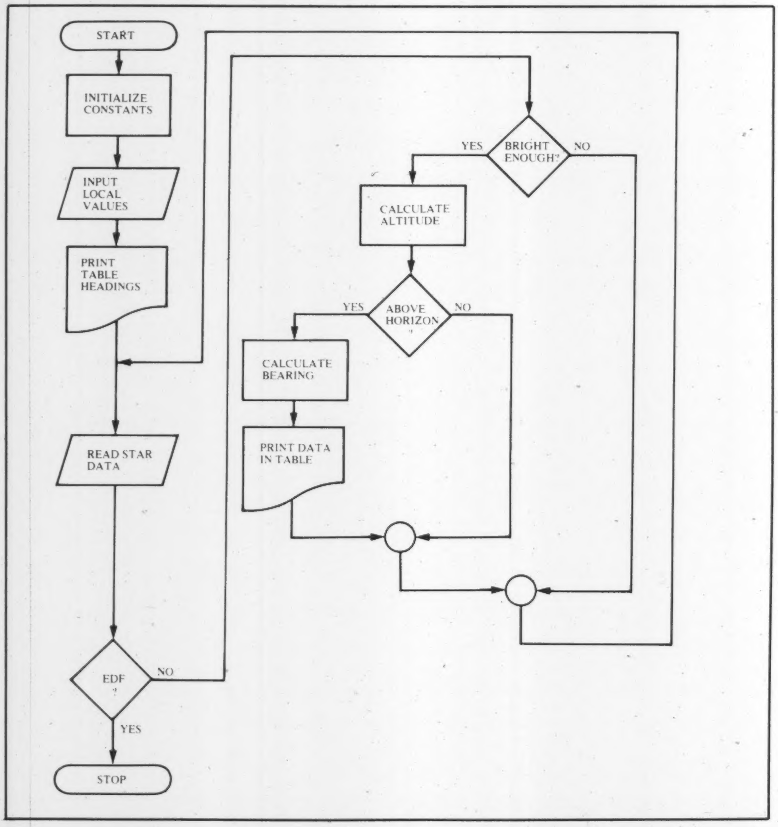
   CELESTIAL OBJECT AVAILABILITY TABLE


DATE 01/14                                  DAYS FROM SEPT. 22 =  114
LOCAL ZONE TIME 22:00 (GMT =  4: 0)         LOCAL STAR TIME  21: 21
LATITUDE  41.4 DEGREES NORTH                LONGITUDE  260.3 DEGREES EAST
OBJECTS BRIGHTER THAN MAG 1                 ZENITH AT  4: 50 HOURS RA


OBJECT                      MAG  R.A.      DECL.     BRNG.     ALT.
--------------------------------------------------------------------

SIRIUS (A-CANIS MAJ)        -1.6 06.43     -16.7     149.9     26.4
CAPELLA (A-AURIGA)            .1  05.14     46.1      39.6     83.7
RIGEL (B-ORION)               .2  05.13    -8.3      172.9      40.0
PROCYON (A-CANIS MIN)         .4  07.37     5.4      122.6      38.4
BETELGEUSE (A-ORION)          .4  05.54     7.4      153.3      53.2
ALDEBARAN (A-TAURUS)          .9  04.34     16.5     189.6     64.8
B-ORION (RIGEL 9)            0    05.13    -8.2      172.9     40.1
A-CANIS MAJ (SIRIUS 10)     -1.5 06.44     -16.7     149.6     26.3
```

Flowchart for STARS.



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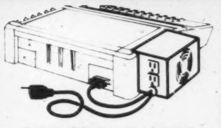

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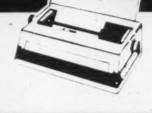

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Star Gazing, continued...

Listing 1.

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105 REM ************************************
110 REM **            STARS.BAS           **
115 REM **  JAMES A. INGRAM   JAN. 7, 1981  **
120 REM ************************************
125 REM
130 REM ******** INSTRUCTIONS ********
135 PRINT CHR$(12):REM CLEAR SCREEN
140 PRINT "***************************************";
145 PRINT "***************************************"
150 PRINT "**                          TABLE OF VISIBLE SKY OBJECTS";TAB(78)"**"
155 PRINT "**       THIS PROGRAM CHECKS THROUGH A MASTER TABLE CONTAINING";
160 PRINT " STARS AND OTHER **"
165 PRINT "** INTERESTING OBJECTS IN THE NIGHT SKY, AND DETERMINES WHICH";
170 PRINT " ONES ARE VIS-    **"
175 PRINT "** IBLE AT A SPECIFIC TIME AND DATE.  IT THEN CALCULATES THE ";
180 PRINT "COMPASS BEARING  **"
185 PRINT "** AND ALTITUDE ABOVE THE HORIZON FOR THAT TIME.  THE TABLE  ";
190 PRINT "INCLUDES THE      **"
195 PRINT "** NAME, MAGNITUDE, RIGHT ASCENSION, DECLINATION, BEARING, AN";
200 PRINT "D ALTITUDE. NOTE **"
205 PRINT "** THAT TIME MUST BE ENTERED IN 24 HOUR FORMAT (2:00 PM = 14:";
210 PRINT "00) AND THAT      **"
215 PRINT "** NUMBERS LESS THAN 10 MUST BE ENTERED AS 2 DIGITS WITH A LE";
220 PRINT "ADING ZERO (05). **"
225 PRINT "***************************************";
230 PRINT "***************************************"
235 PRINT
240 REM
245 REM ******** INITIALIZE CONSTANTS ********
250 LNG=260.3
255 LAT=41.4
260 GX=18
265 N=91:REM NUMBER OF SKY OBJECTS AVAILABLE
270 REM
275 REM ******** INPUT LOCAL VALUES **********
280 INPUT "DATE (MM/DD) : ";D$
285 INPUT "TIME (24 HR. CLOCK) HH:MM : ";T$
290 INPUT "STANDARD TIME (S) OR DAYLIGHT (D) ";F$
295 INPUT "MAXIMUM MAGNITUDE (MIN. BRIGHTNESS) FOR TABLE";MG
300 REM
305 REM ******** CALCULATE BASIC VALUES ******
310 REM ** DECIPHER TIME **
315 TH=VAL(LEFT$(T$,2)):REM ZONE HOURS
320 TM=VAL(RIGHT$(T$,2)):REM ZONE MINUTES
325 TZ=TH+TM/60:REM DECIMAL ZONE TIME
330 IF F$="D" THEN GX=GX+1:REM CORRECT FOR DAYLIGHT SAVINGS TIME
335 GT=TZ-GX:REM UNCORRECTED DECIMAL GMT
340 IF GT<0 THEN GT=GT+24
345 IF GT<24 THEN 360
350    GT=GT-24
355 GOTO 345
360 TL=GT+LNG/360*24:REM UNCORRECTED LOCAL STAR TIME
365 IF TL<24 THEN 380
370    TL=TL-24
375 GOTO 365
380 TL$=STR$(INT(TL))+":"+STR$(INT((TL-INT(TL))*60)):REM STAR TIME STRING
385 GT$=STR$(INT(GT))+":"+STR$(INT((GT-INT(GT))*60)):REM GMT STRING
390 REM
395 REM ** CALCULATE DAYS FROM SEPT. 22 **
400 M=VAL(LEFT$(D$,2)):REM MONTH
405 DY=VAL(RIGHT$(D$,2)):REM DAY
410 IF DY=22 AND M=9 THEN CD=0:GOTO 485
415 IF DY>22 AND M=9 THEN CD=DY-22:GOTO 485
420 IF M=10 THEN CD=8+DY:GOTO 485
425 IF M<9 OR (M=9 AND DY<22) THEN M=M+12:GOTO 440
430 IF M>10 THEN 440
435 PRINT "IMPROPER DATE - RE-ENTER":GOTO 280
440 R=M-10
445 CD=8
450 FOR X=1 TO R:REM ADD UP MONTHS
455   READ D1
460   CD=CD+D1
465 NEXT X
470 DATA 31,30,31,31,28,31,30,31,30,31,31,30
475 RESTORE 860:REM SET DATA POINTER TO FIRST STAR IN TABLE
480 CD=CD+DY:REM ADD IN DAYS IN CURRENT MONTH
485 ZLH=CD*24/365+TL
490 IF ZLH>24 THEN ZLH=ZLH-24
495 ZLH$=STR$(INT(ZLH))+":"+STR$(INT((ZLH-INT(ZLH))*60))
500 REM
505 REM ******** PRINT TABLE HEADING ********
510 PRINT CHR$(17)CHR$(29)CHR$(1):REM PRINTER ON, SET TYPE STYLE
515 PRINT "  CELESTIAL OBJECT AVAILABILITY TABLE"
520 GOSUB 820:REM PRINTER DELAY
525 PRINT CHR$(2):REM STANDARD TYPE
530 PRINT:PRINT
535 PRINT "DATE ";D$;TAB(50)"DAYS FROM SEPT. 22 = ";CD
540 PRINT "LOCAL ZONE TIME ";T$;" (GMT = ";GT$;")";
545 PRINT TAB(50)"LOCAL STAR TIME ";TL$
550 GOSUB 820:REM PRINTER DELAY
555 PRINT "LATITUDE ";LAT;"DEGREES NORTH";
560 PRINT TAB(50)"LONGITUDE ";LNG;"DEGREES EAST"
565 PRINT "OBJECTS BRIGHTER THAN MAG";MG;
570 PRINT TAB(50)"ZENITH AT ";ZLH$;" HOURS RA"
575 GOSUB 820:REM PRINTER DELAY
580 PRINT:PRINT:PRINT
585 PRINT "OBJECT";TAB(35)"MAG";TAB(40)"R.A.";
```

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```
590 PRINT TAB(50)"DECL.";TAB(60)"BRNG.";TAB(70)"ALT."
595 PRINT "----------------------------------------";
600 PRINT "---------------------------------------"
605 PRINT
610 GOSUB 820:REM PRINTER DELAY
615 REM
620 REM ********  MAIN CALCULATION LOOP  ********
625 LAT=LAT*6.28318/360
630 LAT=3.14159/2-LAT
635 FOR J=1 TO N:REM READ DATA TABLE
640   READ N$,BR,RA$,D
645   IF BR>MC THEN 800:REM BELOW BRIGHTNESS LIMIT?
650      RA=VAL(LEFT$(RA$,2))+VAL(RIGHT$(RA$,2))/60
655      ZRA=(RA-ZLH)*15:REM POSITION FROM ZENITH LINE IN DEGREES
660      IF ZRA>360 THEN ZRA=ZRA-360
665      IF ZRA<0 THEN ZRA=ZRA+360
670      ALT=90-D
675      ZPI=ZRA*6.28318/360
680      API=ALT*6.28318/360
685      X=SIN(API)*COS(ZPI):REM CONVERT TO XYZ COORD.
690      Y=SIN(API)*SIN(ZPI)
695      Z=COS(API)
700      X1=X*COS(LAT)-Z*SIN(LAT):REM ROTATE TO ZENITH
705      Z1=X*SIN(LAT)+Z*COS(LAT)
710      X=X1:Z=Z1
715 REM NOTE: ATN( ) FUNCTIONS BELOW ARE VALID FROM -PI/2 TO PI/2 ONLY.
720 REM        ALTITUDE IS WITHIN THIS RANGE, BUT BEARING MUST BE TRANSLATED
725 REM        TO COMPASS HEADING WITHIN EACH QUADRANT OF THE X-Y PLANE.
730      A=ATN(Z/(SQR(X*X+Y*Y)))*360/6.283:REM ALTITUDE ABOVE HORIZON
735      IF A<0 THEN 795: REM BELOW HORIZON?
740         B=ATN(Y/X)*360/6.283:REM COMPASS BEARING
745         IF X>0 AND Y>0 THEN B=180-B:GOTO 765:REM SE QUADRANT
750         IF X>0 AND Y<0 THEN B=180-B:GOTO 765:REM SW QUADRANT
755         IF X<0 AND Y>0 THEN B=-B:GOTO 765:REM NE QUADRANT
760         IF X<0 AND Y<0 THEN B=360-B:GOTO 765:REM NW QUADRANT
765         REM ** PRINT DATA **
770           PRINT N$;TAB(35)BR;TAB(40)RA$;TAB(50)D;
775            PRINT TAB(60);USING "###.#";B;
780            PRINT TAB(70);USING "###.#";A
785            GOSUB 840:REM SHORT PRINTER DELAY
790         REM ** END OF PRINT ROUTINE **
795      REM ** END OF BEARING CALCULATION & PRINT **
800    REM ** END OF VISIBLE STARS ONLY ROUTINE **
805 NEXT J: REM GET NEXT STAR
810 PRINT CHR$(19):REM PRINTER OFF
815 END
820 REM
825 REM ********  PRINTER DELAY LOOPS  ********
830 FOR Q=1 TO 500:NEXT Q
835 RETURN
840 FOR Q=1 TO 100:NEXT Q
845 RETURN
850 REM
855 REM ********  DATA TABLES  ********
860 DATA SIRIUS (A-CANIS MAJ),-1.6,06.43,-16.7
865 DATA CANOPUS (A-CARINA),-.7,06.23,-52.7
870 DATA ARCTURUS (A-BOOTES),-.1,14.14,19.4
875 DATA VEGA (A-LYRA),0,18.36,38.8
880 DATA CAPELLA (A-AURIGA),.1,05.14,46.1
885 DATA RIGEL (B-ORION),.2,05.13,-8.3
890 DATA PROCYON (A-CANIS MIN),.4,07.37,5.4
895 DATA BETELGEUSE (A-ORION),.4,05.54,7.4
900 DATA ALTAIR (A-AQUILA),.8,19.49,8.8
905 DATA ALDEBARAN (A-TAURUS),.9,04.34,16.5
910 DATA ANTARES (A-SCORPIO),1,16.28,-26.3
915 DATA SPICA (A-VIRGO),1,13.24,-11
920 DATA FOMALHAUT (A-PISCIS AUST),1.2,22.56,-29.7
925 DATA POLLUX (B-GEMINI),1.2,07.43,28.1
930 DATA DENEB (A-CYGNUS),1.3,20.40,45.2
935 DATA REGULUS (A-LEO),1.4,10.7,12.1
940 DATA CASTOR (A-GEMINI),1.6,07.33,32
945 DATA ADHARA (E-CANIS MAJ),1.6,06.57,-28.9
950 DATA BELLATRIX (G-ORION),1.6,05.24,6.4
955 DATA SHAULA (L-SCORPIO),1.6,17.32,-37.1
960 DATA ELNATH (B-TAURUS),1.7,05.24,28.6
965 DATA ALNILAM (E-ORION),1.7,05.35,-1.2
970 DATA MIRFAK (A-PERSEUS),1.8,03.22,49.8
975 DATA DUBHE (A-URSA MAJ),1.8,11.2,61.9
980 DATA ALIOTH (E-URSA MAJ),1.8,12.53,56.1
985 DATA GAMMA VELORUM,1.8,08.9,-47.3
990 DATA KAUS AUSTRALIS (E-SAGTRS),1.8,18.22,-34.4
995 DATA ALNITAK (Z-ORION),1.8,05.39,-2
1000 DATA AL NAIR (A-GRUS),1.8,22.6,-47.1
1005 DATA ALKAID (N-URSA MAJ),1.9,13.46,49.5
1010 DATA ALHENA (G-GEMINI),1.9,06.36,16.4
1015 DATA WEZEN (D-CANIS MAJ),1.9,07.7,-26.4
1020 DATA THETA SCORPII,1.9,17.35,-43
1025 DATA MENKALINAN (B-AURIGA),1.9,05.57,45
1030 DATA MIRZAM (B-CANIS MAJ),2,06.21,-17.9
1035 DATA DELTA VELORUM,2,08.44,-54.6
1040 DATA POLARIS (A-URSA MIN),2,02.3,89.1
1045 DATA ALPHARD (A-HYDRA),2,09.26,-8.5
1050 DATA HAMAL (A-ARIES),2,02.5,23.3
1055 DATA DIPHDA (B-CETUS),2,00.42,-18.2
1060 DATA MENKENT (TH-CENTAURI),2,14.5,-36.2
1065 DATA MIRACH (B-ANDROMEDA),2,01.8,35.5
1070 DATA NUNKI (S-SAGGTRS),2.1,18.53,-26.3
1075 DATA RASALHAQUE (A-OPHIUC),2.1,17.34,12.6
```

```
1080 DATA ALPHERATZ (A-ANDROM),2.1,00.7,28.9
1085 DATA ALGOL (B-PERSEUS),2.1,03.6,40.8
1090 DATA KOCHAB (B-URSA MIN),2.1,14.51,74.3
1095 DATA ALMACH (G-ANDROM),2.1,02.2,42.2
1100 DATA SAIPH (K-ORION),2.1,05.54,7.4
1105 DATA SCHEDAR (A-CASSIOPEIA),2.1,00.39,56.4
1110 DATA PSI-PISCES (DBL 30),5.5,01.4,21.2
1115 DATA G-ANDROM. (OR-BL 10),2,02.2,42.2
1120 DATA B-ORION (RIGEL 9),0,05.13,-8.2
1125 DATA TH-ORION (TRAPEZ),5.5,05.34,-5.5
1130 DATA S-ORION (TRI. 11-41),4,05.37,-2.6
1135 DATA A-CANTS MAJ (SIRIUS 10),-1.5,06.44,-16.7
1140 DATA A-GEMINI (CASTOR 75),2,07.32,32
1145 DATA T-CANCER (OR-BL 31),4,08.45,29
1150 DATA G-LEO (DBL 4.5),2.5,10.18,20.2
1155 DATA Z-URSA MAJ (MIZAR 14),2.5,13.23,55.2
1160 DATA E-BOOTES (GD-BL 3),2.5,14.44,27.3
1165 DATA Z-CORONA (DBL 6),5,15.39,36.8
1170 DATA NU-DRACO (DBL 62),5,17.32,55.2
1175 DATA E-LYRA (DBL-DBL 2.7),5,18.44,39.7
1180 DATA B-CYGNI (ALBIREO 34),3,19.30,27.8
1185 DATA G-DELPHIN (YL-GR 10),4.5,20.45,16
1190 DATA NGC869 (PERSEUS CL W),4.5,02.17,57
1195 DATA NGC884 (PERSEUS CL E),4.5,02.21,57
1200 DATA NGC1528 (60 ST. 25'),6.5,04.14,51.2
1205 DATA NGC2632 (M44 BEEHVE),4,08.39,20.1
1210 DATA NGC6523 (M8 LAGOON),5,18.2,-24.4
1215 DATA NGC6618 (M17 OMEGA),7,18.19,-16.2
1220 DATA NGC6720 (M57 RING),9,18.53,33
1225 DATA NGC6853 (M27 DUMBL),7.5,19.59,22.6
1230 DATA NGC5139 (OMEGA GLOB),4,13.25,-47.4
1235 DATA NGC6205 (M13 HERC),5.5,16.41,36.5
1240 DATA NGC6656 (M22 SAGTR),6,18.35,-23.9
1245 DATA NGC1952 (M1 CRAB),8.5,05.33,22
1250 DATA ORION NEB (M42),4,05.33,-5
1255 DATA ANDROM GALAXY (M31),4.8,00.40,41
1260 DATA CANES CLUSTER (M3),6.3,13.40,29
1265 DATA WHIRLPOOL GAL (M51),8.1,13.28,47
1270 DATA CYGNUS CLUST (M39),5.2,21.30,48
1275 DATA OPHIUC CLUST (M10),6.7,16.55,-4
1280 DATA OPHIUC CLUST (M12),6.6,16.45,-2
1285 DATA OPHIUC CLUST (M14),5.7,17.35,-3
1290 DATA PERSEUS SNGL CLSTR (M34),5.5,02.39,43
1295 DATA AQUARIUS CLSTR (M2),6.3,21.31,-1
1300 DATA GEMINI CLSTR (M35),5.3,06.6,24
1305 DATA CANIS MAJ OC (M41),4.6,06.45,-21
1310 DATA MONOCEROS OC (M50),6.3,07.1,-8
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CIRCLE 237 ON READER SERVICE CARD

Star Gazing, continued...

```
********************************************************************************

                            STARS.BAS - INTERACTIVE VERSION
     THIS PROCRAM DETERMINES THE COMPASS BEARINC AND ALTITUDE OF
ANY STAR AT A SPECIFIC TIME AND DATE.  YOU MUST ENTER THE DATE,
THE TIME, AND THE RICHT ASCENSION AND DECLINATION OF THE STAR.
DATE, TIME, AND RIGHT ASCENSION NUMBERS MUST BE ENTERED AS A FIVE
DIGIT STRINC, SUCH AS '01/14' OR '04:30'.  TIME MUST BE IN 24-
HOUR FORMAT.

********************************************************************************
ENTER DATE (MM/DD) :? 01/14
ENTER TIME IN 24-HOUR FORMAT (HH:MM) :? 22:00
ENTER RICHT ASCENSION.(HH:MM) :? 06:33
ENTER DECLINATION (D.DD) :? 14.2

LOCAL ZONE TIME = 22:00                         LOCAL STAR TIME =  21: 21
ZENITH MERIDIAN RA =  7: 29                     DAYS FROM 9/22 =  114
RIGHT ASCENSION = 06:33                         DECLINATION = 14.2

                                                COMPASS BEARINC = 208.5

                                                ALTITUDE =  60.1

ANOTHER STAR (Y/N) ? Y
ENTER TIME IN 24-HOUR FORMAT (HH:MM) :? 22:00
ENTER RICHT ASCENSION (HH:MM) :? 16 4:50
ENTER DECLINATION (D.DD) :? 5.8
STAR IS BELOW HORIZON
ANOTHER STAR (Y/N) ? N
OK
```

Listing 2.

```
100 REM ******************************
105 REM          FSTARS.BAS
110 REM  JAMES A. INGRAM  01/14/81
115 REM ******************************
120 REM
125 REM ********  PRINT INSTRUCTIONS  ********
130 PRINT CHR$(12):REM CLEAR SCREEN
135 PRINT "****************************************";
140 PRINT "****************************************"
145 PRINT
150 PRINT "                         STARS.BAS - INTERACTIVE VERSION"
155 PRINT "     THIS PROGRAM DETERMINES THE COMPASS BEARING AND ALTITUDE OF"
160 PRINT "ANY STAR AT A SPECIFIC TIME AND DATE.  YOU MUST ENTER THE DATE,"
165 PRINT "THE TIME, AND THE RICHT ASCENSION AND DECLINATION OF THE STAR."
170 PRINT "DATE, TIME, AND RIGHT ASCENSION NUMBERS MUST BE ENTERED AS A FIVE"
175 PRINT "DIGIT STRING, SUCH AS '01/14' OR '04:30'.  TIME MUST BE IN 24-"
180 PRINT "HOUR FORMAT."
185 PRINT
190 PRINT "****************************************";
195 PRINT "****************************************"
200 REM
205 REM ********  INITIALIZE  ********
210 LAT=41.4:REM LOCAL LATITUDE
215 LNG=260.3:REM LOCAL LONGITUDE
220 ROT=(90-LAT)*6.28318/360:REM RQTATION FROM POLARIS TO ZENITH
225 GX=18:REM CORRECT LOCAL ZONE TIME TO GMT
230 REM
235 REM ******** INPUT CURRENT VARIABLES ********
240 INPUT "ENTER DATE (MM/DD) :";D$
245 PRINT CHR$(12):REM CLEAR SCREEN
250 INPUT "ENTER TIME IN 24-HOUR FORMAT (HH:MM) :";T$
255 INPUT "ENTER RIGHT ASCENSION (HH:MM) :";RA$
260 INPUT "ENTER DECLINATION (D.DD) :";D
265 REM
270 REM ** CALCULATE DAYS FROM SEPT. 22 **
275 M=VAL(LEFT$(D$,2)):REM MONTH
280 DY=VAL(RIGHT$(D$,2)):REM DAY
285 IF DY=22 AND M=9 THEN CD=0:GOTO 355
290 IF DY>22 AND M=9 THEN CD=DY-22:GOTO 355
295 IF M=10 THEN CD=8+DY:GOTO 355
300 IF M<9 OR (M=9 AND DY<22) THEN M=M+12:GOTO 310
305 IF M>10 THEN 310
310 R=M-10
315 CD=8
320 FOR X=1 TO R:REM ADD UP MONTHS
325   READ D1
330   CD=CD+D1
335 NEXT X
340 DATA 31,30,31,31,28,31,30,31,30,31,31,30
345 RESTORE 340
350 CD=CD+DY:REM ADD IN DAYS IN CURRENT MONTH
355 ZLH=CD*24/365+TL
360 IF ZLH>24 THEN ZLH=ZLH-24
365 ZLH$=STR$(INT(ZLH))+":"+STR$(INT((ZLH-INT(ZLH))*60))
370 REM ******** CALCULATE BASIC VALUES ******
375 REM ** DECIPHER TIME **
380 TH=VAL(LEFT$(T$,2)):REM ZONE HOURS
385 TM=VAL(RICHT$(T$,2)):REM ZONE MINUTES
390 TZ=TH+TM/60:REM DECIMAL ZONE TIME
395 IF F$="D" THEN GX=GX-1:REM CORRECT FOR DAYLICHT SAVINCS TIME
400 GT=TZ-GX:REM UNCORRECTED DECIMAL GMT
405 IF GT<0 THEN GT=GT+24
410 IF GT<24 THEN 425
415    GT=GT-24
420 GOTO 410
```

```
425 TL=GT+LNG/360*24:REM UNCORRECTED LOCAL STAR TIME
430 IF TL<24 THEN 445
435    TL=TL-24
440 GOTO 430
445 TL$=STR$(INT(TL))+":"+STR$(INT((TL-INT(TL))*60)):REM STAR TIME STRING
450 GT$=STR$(INT(GT))+":"+STR$(INT((GT-INT(GT))*60)):REM GMT STRING
455 REM END OF CALCULATIONS
460 REM *******  MAIN CALCULATION LOOP  *******
465       RA=VAL(LEFT$(RA$,2))+VAL(RIGHT$(RA$,2))/60
470       ZRA=(RA-ZLH)*15:REM POSITION FROM ZENITH LINE IN DEGREES
475       IF ZRA>360 THEN ZRA=ZRA-360
480       IF ZRA<0 THEN ZRA=ZRA+360
485       ALT=90-D
490       ZPI=ZRA*6.28318/360
495       API=ALT*6.28318/360
500       X=SIN(API)*COS(ZPI):REM CONVERT TO XYZ COORD.
505       Y=SIN(API)*SIN(ZPI)
510       Z=COS(API)
515       X1=X*COS(ROT)-Z*SIN(ROT):REM ROTATE TO ZENITH
520       Z1=X*SIN(ROT)+Z*COS(ROT)
525       X=X1:Z=Z1
530 REM NOTE: ATN( ) FUNCTIONS BELOW ARE VALID FROM -PI/2 TO PI/2 ONLY.
535 REM       ALTITUDE IS WITHIN THIS RANGE, BUT BEARING MUST BE TRANSLATED
540 REM       TO COMPASS HEADING WITHIN EACH QUADRANT OF THE X-Y PLANE.
545       A=ATN(Z/(SQR(X*X+Y*Y)))*360/6.283:REM ALTITUDE ABOVE HORIZON
550       IF A<0 THEN PRINT "STAR IS BELOW HORIZON":GOTO 625
555          B=ATN(Y/X)*360/6.283:REM COMPASS BEARING
560          IF X>0 AND Y>0 THEN B=180-B:GOTO 580:REM SE QUADRANT
565          IF X>0 AND Y<0 THEN B=180-B:GOTO 580:REM SW QUADRANT
570          IF X<0 AND Y>0 THEN B=-B:GOTO 580:REM NE QUADRANT
575          IF X<0 AND Y<0 THEN B=360-B:GOTO 580:REM NW QUADRANT
580 REM END OF CALCULATIONS
585 PRINT CHR$(12):REM CLEAR SCREEN
590 PRINT "LOCAL ZONE TIME = ";T$;TAB(40)"LOCAL STAR TIME = ";TL$
595 PRINT "ZENITH MERIDIAN RA = ";ZLH$;TAB(40)"DAYS FROM 9/22 = ";CD
600 PRINT "RIGHT ASCENSION = ";RA$;TAB(40)"DECLINATION =";D
605 PRINT
610 PRINT "COMPASS BEARING = ";USING "###.#";B;
615 PRINT TAB(40)"ALTITUDE = ";USING "###.#";A
620 PRINT
625 INPUT "ANOTHER STAR (Y/N) ";K$
630 IF K$="Y" THEN 245
635 END
```

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CIRCLE 184 ON READER SERVICE CARD

Soaring Cycles

Daniel Storch

With the roar of the crowd in your ears, you nose your motorcycle up to the starting line. You nervously glance down the long runway to the ramp and the ten buses beyond. There is no time to turn back.

Letting out the clutch, you gun the engine. You race down the runway gaining speed and watch as the ramp looms closer. With a jarring impact, your bike hits the ramp and goes flying through the air.

From your bird's eye view, you know it is going to be close. As your bike descends, you check your position . . . it will be close . . .

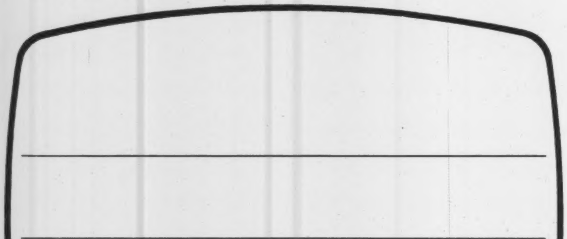
No need to worry though, because if you crash, you will only have to run the program again. Soaring Cycles is a fast, high-resolution graphics simulation of a motorcycle jump. It is written in Applesoft Basic and uses standard shape tables and sound effects.

When writing this program, I valued clarity over efficiency, so some parts of the program may seem rather slow and cumbersome. However, it can easily be modified to obtain quicker and smoother animation (not only by using more ad-

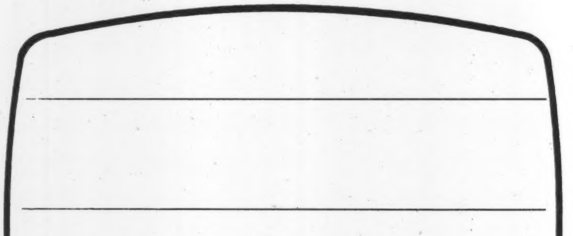
---

Daniel Storch, Box 133, R.D. #1, Avonmore, PA 15618.

Middle of a jump.



A successful jump.



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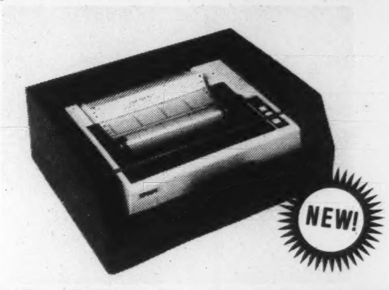

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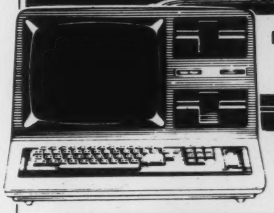

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CIRCLE 234 ON READER SERVICE CARD

vanced animation techniques, but by generally improving the program execution speed).

The Program

To aid you in understanding the program better and to guide you in modifying it, I have listed the variables used and a step-by-step explanation of how the program works.

Variables

B - Number of buses you wish to jump.

K - If K = 1 then you have crashed; if not, you made a successful jump.

N - The new throttle setting.

O - The old throttle setting.

S - The sound constant.

S1 - The shape rotation variable.

X1 - The x coordinate of the motorcycle for drawing.

X2 - The x coordinate of the motorcycle for erasing.

Y1 - The y coordinate of the motorcycle for drawing.

Y2 - The y coordinate of the motorcycle for erasing.

C, I, P, V - Used in FOR/NEXT loops.

Explanation

Lines 10-100 print the title page and instructions.

Lines 110-180 initialize the program.

Lines 190-240 draw the buses, the ground, and the ramps.

Lines 250-260 read the paddle, update the variables, and check for overacceleration (top of the main program loop).

Line 270 determines if you have hit the ramp yet.

Line 280 is the sound routine.

Line 290 changes the x coordinate of the bike.

If the motorcycle goes off the screen to the left, line 300 lowers it a level and sets it back to the far right.

Line 310 erases the motorcycle at the old position, draws it at the new position, and goes to the top of the loop.

The short loop in lines 350-430 shows the bike flying upward off the ramp (The angle of flight depends on speed).

Lines 440-490 make the bike descend (Line 480 determines if the bike has landed and whether or not the jump is successful).

If you are still alive, line 500 sends the program to the victory routine.

Lines 510-560 prepare the screen for the crash.

Lines 570-640 are the crash loop that makes your motorbike go in circles.

Lines 650-670 draw the bike resting upside down on the ground.

Line 680 returns to the beginning of the program so you can try again.

Lines 690-710 prepare the screen and print the victory message.

The victory routine in lines 720-770 shows your motorcycle triumphantly riding a wheelie off the screen.

```
5600- 04 00 0A 00 10 00 2C 00
5608- 46 00 3E 24 2D 36 04 00
5610- 24 24 24 24 0D 18 0D 18
5618- 2D 0E 0E 36 36 36 36 27
5620- 3C 3F 37 26 08 18 08 18
5628- 2D 2D 04 00 0F 18 0C 0E
5630- DF FF 3F 0F 18 2D 2D 2D
5638- DC 0C 18 3F 1E 37 2D FD
5640- 1B F7 1E 37 25 00 3F 3F
5648- 3F 3F 3F 3F 3F 24 24 24
5650- 74 F1 49 4E 4E 4E 4E 04
5658- 00
*
```

Shape Table.

I was able to use eight different rotations for my shapes even though page 99 of the Applesoft Reference Manual states that when the SCALE=1 only four are available.

Entering the Program

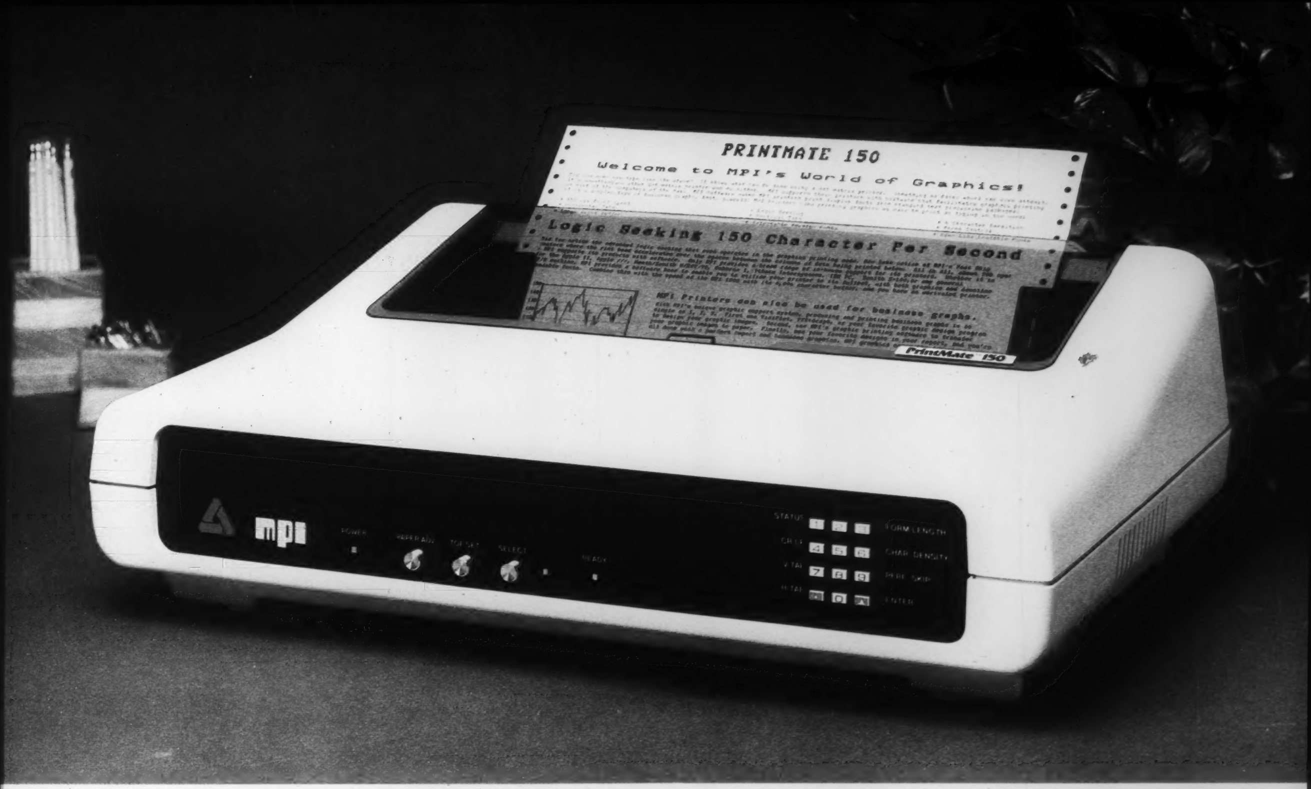
Soaring Cycles contains two parts which must be entered, the Applesoft Basic program and the shape table. After entering the Basic program, simply type SAVE SOARING CYCLES. Now, go into the system monitor (using CALL-151) and program in the shape table. When you are finished, just type BSAVE BIKE, A$5600, L$60.

Now strap on your crash helmet, put on your riding gloves, and run the program. □

Listing 1.

```
0 O = 5
10  REM    SOARING CYCLES
20  REM    BY DAN STORCH
30  REM    MAY, 1982
35  LOMEM: 16384
40  TEXT : HOME : NORMAL : FOR C = 1 TO 40: PRINT "*";: NEXT C
50  PRINT : PRINT  TAB( 13)"SOARING CYCLES"
60  PRINT  TAB( 14)"BY DAN STORCH"
70  PRINT : FOR C = 1 TO 40: PRINT "*";: NEXT C
80  PRINT : PRINT : PRINT "YOU ARE THE PILOT OF THE MOTORBIKE. YOUROBJECT
     : TO JUMP AS MANY BUSES AS YOU   CAN WITHOUT CRASHING. PDL(0) IS YO
    UR"
90  PRINT "THROTTLE, BUT, BEWARE, IF YOU ACCELERATEOR DECCERERATE TOO QUI
    CKLY, THE ENGINE  WILL STALL.  GOOD LUCK AND HAPPY FLYING."
100  PRINT : PRINT "HIT ANY KEY TO CONTINUE...";: GET C$
110  HOME : VTAB 21
120  INPUT "DO YOU WISH TO LOAD THE SHAPE TABLE ? ";A$: IF  LEFT$ (A$,1) =
    "Y" THEN  PRINT  CHR$ (4);"BLOAD BIKE"
130  INPUT "HOW MANY BUSES DO YOU WISH TO JUMP ? ",B
140  HOME : VTAB 21: PRINT "TURN PDL(0) ALL THE WAY TO THE LEFT AND HIT A
    NY KEY...": GET C$
150  POKE 232,0: POKE 233,86
170  HGR : ROT= 0: SCALE= 1: HCOLOR= 3
180 X1 = 265:Y1 = 49:X2 = 265:Y2 = 49
190  HPLOT 0,50 TO 279,50: HPLOT 0,100 TO 279,100: HPLOT 0,150 TO 279,150

200  FOR I = 1 TO B: DRAW 2 AT 220 - (10 * I),149: NEXT I
210 R1 = 230 - (10 * (B + 1))
220  HPLOT 230 - (10 * (I + 1)),149 TO (230 - (10 * (I + 1)) - 15),149 TO
    230 - (10 * (I + 1)),138 TO 230 - (10 * (I + 1)),149
230  HPLOT 240,149 TO 225,149 TO 225,138 TO 240,149
240  XDRAW 3 AT 265,49
250 N =  PDL (0) / 25: IF (N - O) > 4 THEN  GOTO 130
260 O = N
270  IF Y1 > 100 AND X1 < 250 GOTO 350
280  FOR P = 1 TO N / 3:S =  PEEK ( - 16336): NEXT P
290 X1 = X1 - N
300  IF X1 <  = 20 THEN  XDRAW 3 AT X2,Y2:Y1 = Y1 + 50:Y2 = Y1:X1 = 265:X
    2 = X1: XDRAW 3 AT X1,Y1
310  XDRAW 3 AT X2,Y2: XDRAW 3 AT X1,Y1:X2 = X1:Y2 = Y1: GOTO 250
350  XDRAW 3 AT X1,Y1: ROT= 9
370  XDRAW 3 AT X1,Y1
380  FOR Y1 = 150 TO 125 STEP  - 2.3
390  FOR P = 1 TO N / 3:S =  PEEK ( - 16336): NEXT P
400  XDRAW 3 AT X2,Y2: XDRAW 3 AT X1,Y1:X2 = X1:Y2 = Y1
410 X1 = X1 - N
420  NEXT Y1
430  XDRAW 3 AT X1,Y1: XDRAW 3 AT X1,Y1
440  FOR Y1 = 125 TO 150 STEP 2.3
450  FOR P = 1 TO N / 3:S =  PEEK ( - 16336): NEXT P
460  XDRAW 3 AT X2,Y2: XDRAW 3 AT X1,Y1:X2 = X1:Y2 = Y1
470 X1 = X1 - N
480  IF Y1 >  = 148 THEN  IF X1 > (R1 - 20) OR X1 < (R1 - 35) THEN K = 1
490  NEXT Y1
500  IF K <  > 1 GOTO 690
510  HOME : VTAB 24: PRINT "YOU CRASHED!!!"
520  XDRAW 3 AT X2,Y2
530 X2 = X1:Y2 = Y1
540  ROT= 0
550  XDRAW 3 AT X2,Y2
560 Y1 = 140
570  FOR V = 1 TO 5
580  FOR S1 = 64 TO 8 STEP  - 8
590 X1 = X1 - 2
600  ROT= S2: XDRAW 3 AT X2,Y2: ROT= S1: XDRAW 3 AT X1,Y1
610 X2 = X1:Y2 = Y1:S2 = S1
620  IF X1 < 10 THEN  GOTO 650
630  NEXT S1
640  NEXT V
650  XDRAW 3 AT X2,Y2
670  ROT= 32: XDRAW 3 AT X1,144
680  RUN 130
690  XDRAW 3 AT X2,Y2
700 Y1 = 149:Y2 = Y1:X2 = X1
710  FLASH : HOME : VTAB 24: PRINT "CONGRATULATIONS! YOU'VE JUMPED ";B;"
    BUSES!": NORMAL
720  XDRAW 3 AT X2,Y2:X =  PEEK ( - 16336)
730  XDRAW 3 AT X1,Y1
740 X1 = X1 - 2
750 X2 = X1
760  IF X1 < 25 THEN  END
770  GOTO 720
```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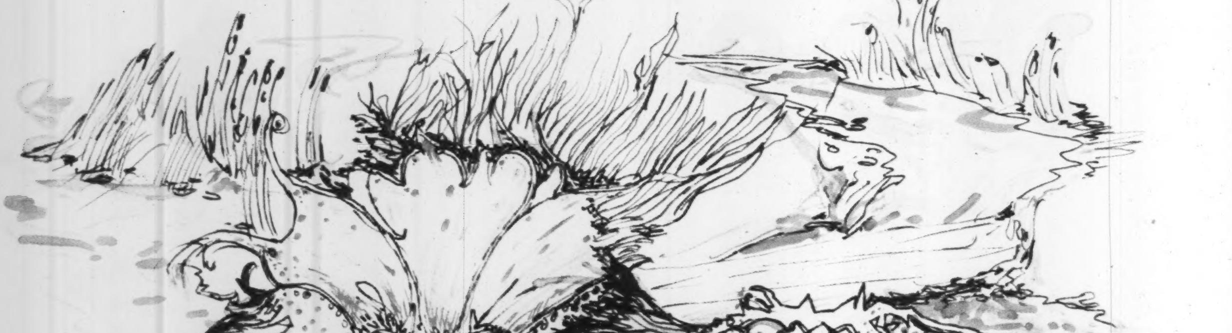
World Builder: A Modest Program for Designing Strange New Worlds



Stephen Kimmel

Poluxxy Araxxanas raised his head and looked at the dismembered corpse of his foe with nictitating eyes. He clacked the chitin of his mouth opening and raised his four arms to the huge red sun. The sound tied in his throat uncarried by the thin air. On this cold day, victory was his. And the taste of it was bitter.

That is what computers and science fiction are about.

Both computers and science fiction offer the possibility of exploring worlds and futures that could never be explored in reality. Or which would be instantly fatal if you could. Anyone who uses the computer strictly as a means of freeing valuable time to work more efficiently is missing part of what computers can do. World Builder for the TRS-80 is designed to help bridge the gap and perhaps enrich both science fiction and computers.

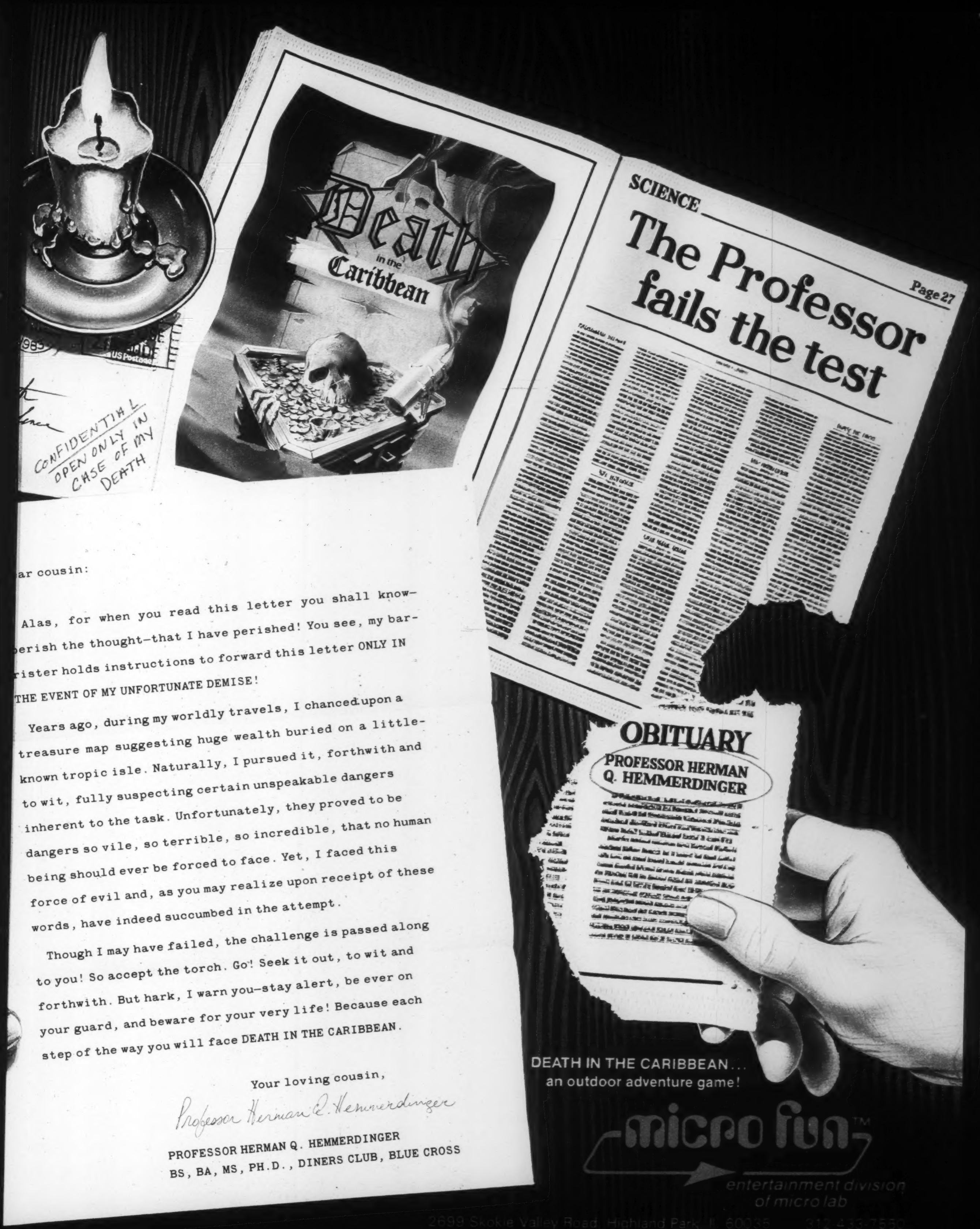
Why a World Builder?

As a science fiction writer, I have an obligation to my readers to design consistent, believable worlds. This can be a tedious process. There is always the temptation simply to change the color of chlorophyll from green to blue and let it go at that. Giving into temptation results in weaker science fiction so I designed World Builder to help out. After seeing two recent articles in *Creative* dealing with astronomy, I decided to modify it for general use.

World Builder is of interest even to those who don't read science fiction. It has possibilities for use as an educational science program. Consider it a game, if nothing else. Your first goal is to design a planet on which life can occur. That is hard enough. The second goal is even harder: create a world that could be inhabited by humans. You will

---

Stephen Kimmel, 4756 S. Irvington Pl., Tulsa, OK 74135.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Page 27
The Professor fails the test
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ar cousin:

Alas, for when you read this letter you shall know—perish the thought—that I have perished! You see, my barrister holds instructions to forward this letter ONLY IN THE EVENT OF MY UNFORTUNATE DEMISE!

Years ago, during my worldly travels, I chanced upon a treasure map suggesting huge wealth buried on a little-known tropic isle. Naturally, I pursued it, forthwith and to wit, fully suspecting certain unspeakable dangers inherent to the task. Unfortunately, they proved to be dangers so vile, so terrible, so incredible, that no human being should ever be forced to face. Yet, I faced this force of evil and, as you may realize upon receipt of these words, have indeed succumbed in the attempt.

Though I may have failed, the challenge is passed along to you! So accept the torch. Go! Seek it out, to wit and forthwith. But hark, I warn you—stay alert, be ever on your guard, and beware for your very life! Because each step of the way you will face DEATH IN THE CARIBBEAN.

Your loving cousin,

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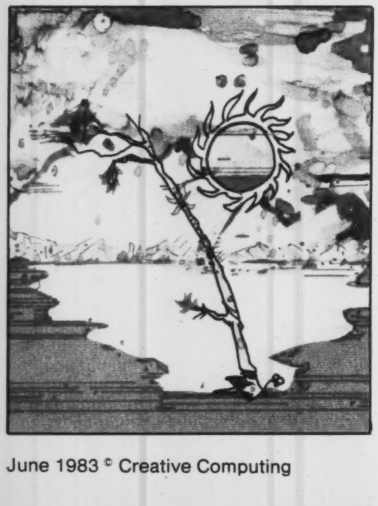
find that the parameters for life in general and humanity in particular are tight.

Most of what follows is rather technical. I won't be upset if you wish to skip it. I will, however, suggest that you read *Planets for Man* by Stephen Dole and Isaac Asimov. It is easy reading and fun. Much of this program is based on that book and on *How to Build a Planet* by Poul Anderson.

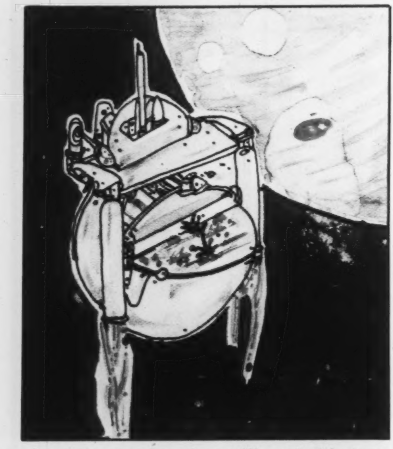
In the Beginning There Was Light

We begin with a star. The sun of any planetary system is the great thermonuclear engine that drives the system. Everything else depends on it. The star may be so large that its formation consumed all the nearby matter. If that is the case, then there can be no planets. Another possibility is that the star is so small that its gravity won't hold a planet of any appreciable size. Again, our quest for a habitable planet has come to a quick end. When the star dies, it will almost certainly destroy any planet close enough to support life. Therefore we can't have too old a star. The larger stars come to this end at an early age and in a most spectacular way—the super nova.



World Builder has two built-in assumptions concerning the star. First, the program assumes that the star is on the "main sequence" of the Hertzsprung-Russell diagram (a plot of spectral classes vs. the absolute magnitude or luminosity of stars). The 1% of all stars that don't fall on the main sequence are stars being born, which certainly won't have evolved life; stars that are dying, which have destroyed any life that might have evolved; and a few odd stars that we can probably ignore safely. The vast majority of stars settle into a position on the sequence according to their mass and spend most of their lives there. These are the stars that have the potential to host life.

The second assumption in World Builder is that the star either is not a binary star or can be treated as a single star. If the two stars of a binary are close enough, the planet can orbit both of them at once in what will probably be a highly eccentric orbit. Life may be possible, although the planet probably won't be habitable by people due to the extreme seasonal temperature variation. If the binary stars are far enough apart, then the planet could orbit one while feeling little impact from the other.



Consider what life on earth would be like if, instead of having Pluto, we had a small star. Pluto receives so little energy from the sun that its surface temperature is just a few degrees above absolute zero. Likewise, our second star would contribute little energy to us. The result would be a more eccentric orbit and a light in the sky brighter than anything but the sun and the moon. The main effect would be on our mythologies.

World Builder contains data on 36 stars including 17 nearby stars felt to have a reasonable chance (greater than 1% but never more than 6%) of having inhabited planets. The rest of the stars

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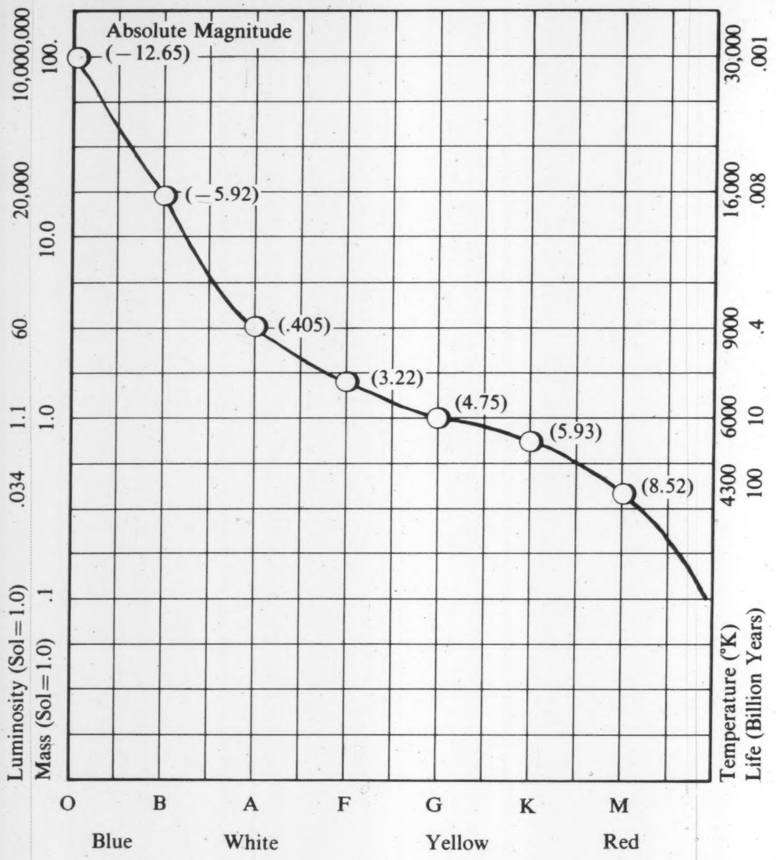
Figure 1. The Hertzsprung-Russell Diagram.



on the list are well known. The complete list includes most of the brightest stars and a few that can't be seen with the unaided eye.

Most of the stars are on the main sequence illustrated in Figure 1. The most significant exceptions are the giants, Rigel, Deneb, Betelgeuse, Antares, Capella, Aldebaran, Arcturus, and Pollux. Obviously this doesn't begin to exhaust the eighty gajillion stars, so the program has the option of using stars not on the list. To use a star not on the list requires the use of either the spectral class of the star or its absolute magnitude.

The Business of Designing a Planet

Once we have settled on a star, we can get down to some of the more immediate matters. Planets come in all sizes and locations. Our own solar system has an interesting assortment of them. It should be said that the science isn't precise. Much of what this program does is speculation and approximation. We have only visited four bodies that could be considered planets. The others we have either studied from Earth or from "close-ups" of several thousand miles. At the range of some of these close-ups, we might be able to resolve objects as small as New Jersey. There would be uncertainty about whether Earth was inhabited by intelligent beings. Come to think of it, I know some people who have the same doubts about Oklahoma.

After settling on a star, the most important discretionary item available to us as planet builders is the average temperature of the planet. Temperature is probably the single most important factor in determining habitability. It also sets the approximate radius of the orbit of the planet about its sun. That, in turn, determines the length of the planet year, and how big the star will appear from the planet.

The size and location of any moons and the sun will determine how rapidly the planet rotates. We have a 24-hour day because the tidal forces of our moon have slowed the Earth down to that point. Jupiter, whose moons are much smaller in relation to it than our moon is to us, has a day that is less than 10 hours long. Jupiter is also much farther from the sun, so its tidal forces have little effect.

The rotation of Venus, despite its having no moon, has been essentially stopped by tidal forces caused by the sun. The importance of this to the temperature of the planet is great. The dark side of Mercury gets down to −380°F, while the temperature on the sun side gets over 600°F. A planet with a shorter day will have smaller variations in its high and low temperature.

The tilt of the planet on its axis also has a profound impact on the temperature of the planet. As every school child knows, winter occurs when the portion of the Earth we happen to be on is tilted away from the sun. Earth has an axis tilt of nearly 24 degrees. If the tilt were less, then summer and winter would be more alike. A greater tilt would make a hotter summer and a colder winter.

The final factor contributing to the temperature profile of the planet is its orbital eccentricity. Planets do not travel in perfect circles but in ellipses. Eccentricity is a measure of the deviation from a perfect circle. It determines the perihelion (the point of closest approach to the star) and aphelion (the point of greatest distance from the star). The closer the planet is to the star the warmer it is; the further away, the colder.

On Earth, which has a small eccentricity, the variation is a few degrees. Summers are slightly warmer and winters slightly colder south of the equator. If we had an eccentricity as high as that of Pluto, the difference would be substantial.

The gravity of the planet is the last important characteristic that we are free to set. This contributes significantly to determining the nature of the atmosphere and the nature of life on the planet. If there is life on Jupiter, and some scientists are serious about the possibility, then it certainly won't look human. And it won't be able to survive on Earth.

Gravity directly affects the makeup of the atmosphere. If the gravity is too high, the planet won't lose its primordial hydrogen; it will be a gas giant. If the gravity is too low, the planet won't be able to hold onto its oxygen in gaseous form. The result is a planet with an extremely thin atmosphere similar to that found on the moon and on Mars.

World Builder does not consider the chemical composition of the atmosphere, and that is probably a major weakness of the program. World Builder would predict for Venus an atmosphere slightly thinner than that of Earth. That is not the case. Venus has a massive atmosphere with a composition radically different from Earth's, due in part at least to high concentrations of carbon di-

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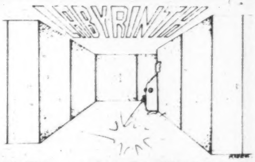

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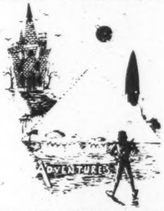

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Authors note to players — I wrote this one with a concordance in hand. It is very accurate — and a lot of fun. It was nice to wander around the ship instead of watching it on T.V.

DERELICT by Rodger Olsen and Bob Anderson — For Wealth and Glory, you have to ransack a thousand year old space ship. You'll have to learn to speak their language and operate the machinery they left behind. The hardest problem of all is to live through it.

Authors note to players — This adventure is the new winner in the "Toughest Adventure at Aardvark Sweepstakes". Our most difficult problem in writing the adventure was to keep it logical and realistic. There are no irrational traps and sudden senseless deaths in Derelict. This ship was designed to be perfectly safe for its' builders. It just happens to be deadly to alien invaders like you.

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PYRAMID by Rodger Olsen — This is one of our toughest Adventures. Average time through the Pyramid is 50 to 70 hours. The old boys who built this Pyramid did not mean for it to be ransacked by people like you.

Authors note to players — This is a very entertaining and very tough adventure. I left clues everywhere but came up with some ingenous problems. This one has captivated people so much that I get calls daily from as far away as New Zealand and France from bleary eyed people who are stuck in the Pyramid and desperate for more clues.

MARS by Rodger Olsen — Your ship crashed on the Red Planet and you have to get home. You will have to explore a Martian city, repair your ship and deal with possibly hostile aliens to get home again.

Authors note to players — This is highly recommended as a first adventure. It is in no way simple—playing time normally runs from 30 to 50 hours — but it is constructed in a more "open" manner to let you try out adventuring and get used to the game before you hit the really tough problems.

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oxide. In defense of World Builder it must be said that Venus could be terraformed into retaining an Earth-like atmosphere.

The Question of Life

For purposes of this program, I assume that life is a carbon-based chemistry that requires liquid water in its environment. There are several other possibilities although we currently have no proof that any of them exist. Perhaps the most likely are those which don't require liquid water, either converting ice or water vapor to water in their bodies. However, I don't see how such life could evolve without a period of liquid water on the planet.

There are four requirements for life in the restricted context of this program. There must be liquid water at least some of the time. The atmosphere must contain some oxygen. The star must not have died. And there must be enough time for life to evolve.

What will that life be like? That is the question. To some extent, we expect it to look familiar. Function pushes evolution along the same lines. Thus dolphins, goldfish and sharks have similar form despite having radically different heritages. A classic example is bats and birds. We should be able to recognize fish and birds as such no matter what planet they come from.

Land creatures offer a much wider range of variation. No one can say that every possible combination has been tried on Earth. Some other arrangements might be highly successful in other environments. Still we should be able to recognize eyes, legs and mouths. Hands may be a different story, although our design should work in almost any environment.

Gravity is the primary factor affecting life that is dealt with in World Builder. High gravity makes it harder to stand up. Anything that isn't hugging the ground will be more heavily reinforced than it would be on Earth. Bodies and trees will be thicker and shorter. Rising up on two legs may be impossible.

Low gravity would have the opposite effect. With less pull to overcome, rising on two legs is easier. Creatures need less reinforcement to overcome gravity. The air should be thinner, reducing the effect of the wind and the ability to carry sounds. Beings in a thick, high gravity atmosphere would place a premium on a streamlined form. Creatures in a low gravity, thin atmosphere won't consider this such an advantage.

Temperature:	
Mean Annual Temperature	min 32°F
	max 86°F
High Daily Mean	less than 120°F
Low Daily Mean	greater than −10°F
Gravity	min .68 (Earth=1.)
	max 1.5
Mass	min .4
	max 2.35
Day	less than 96 hours
Surface Water	Liquid <90%
Prevailing Wind	<50 mph
Atmosphere:	
Pressure	min 2 psia
	max 50 psia
Oxygen, partial pressure	min 50 mmHg
	max 400 mmHg
Other Life	

Figure 2. Requirements for human habitability.

And humans? Will they be able to live on the planet? I have taken the restrictions to be those shown in Figure 2. One requirement is for other life. Without an existing biosphere with all its delicate balances and support systems, we would be living in an artificial environment. Without photosynthesis to regenerate oxygen, we would have to generate it ourselves. Again, there is little point in leaving the relative comfort and safety of our space craft if we must rebuild it on the surface of the planet. Of course, you might terraform an otherwise uninhabitable planet, but that is a matter beyond the scope of this program.

Thoughts on Earth

At first glance, Earth appears to have a unique position in the cosmos. You couldn't adjust the parameters of World Builder too much without making it uninhabitable. This really doesn't come as a surprise. Of the four bodies we have visited, Earth, Mars, Venus, and the moon, only Earth has what is unquestionably life.

There probably is no life anywhere else in our solar system. The only other candidates are long shots. Isolated pockets on Mars and the clouds of Jupiter don't seem particularly promising and Saturn's moon, Titan, is only slightly better. If the assumptions of this program are correct, we have no better than a fifty-fifty chance of finding a habitable planet within 25 light years of Earth.

Earth is the nearly perfect home for humanity but not because it was created that way. Humanity was created, by whatever means, to be perfectly at home on Earth. We grew up here. We wouldn't expect to do any better on most other planets than we would expect a sparrow to do under water. If we had grown up on Titan, a −200°F methane pool would seem perfect for a hot summer's swim.

Is Earth the sole harbor of life in the black sea of space? I can't believe that it is. There are billions and billions of stars (sorry, Carl) out there and at least an equal number of planets. If there is no life anywhere else in the universe then that is a waste unparalleled by anything in creation. The probability that Earth is the exclusive home for life is well over a billion to one. It might be, but I wouldn't bet on it. ☐

World Builder Listing

```
10 CLS: FOR I=1TO 40: POKE 15360+RND(1000),42:NEXT:A$="NO"
20 PRINT@524,"WORLD BUILDER";
30 PRINT@588,"BY STEPHEN KIMMEL";
40 PRINT@716,"A PROGRAM FOR DESIGNING WORLDS";
50 PRINT@780,"WHERE NO MAN HAS BEEN BEFORE";
60 DIM SC$(8),M(8),C$(8),S$(36),LS(36),SS$(36),SM(36),MP(15),R(15)
70 FOR I=1TO8:READ SC$(I),M(I),C$(I):NEXT I
80 FOR I=1TO17:READ S$(I),SS$(I),SM(I):LS(I)=SM(I)[3.5:NEXT
90 FOR I=18TO36:READ S$(I),SS$(I),LS(I):SM(I)=LS(I)[.285714:NEXT
100 DATA O,100,BLUE,B,17,PALE BLUE,A,3.2,WHITE,F,1.54,PALE YELLOW
110 DATA G,1.02,YELLOW,K,.75,ORANGE,M,.38,RED,D,0.,RED
120 DATA SOL,G2,1.0,ALPHA CENTURI A,G4,1.08,ALPHA CENTURI B,K1,.88
130 DATA EPSILON ERIDANI,K2,.80,TAU CETI,G8,.82
140 DATA 70 OPHIUCHI A,K1,.9,70 OPHIUCHI B,K5,.65
150 DATA ETA CASSIOPEIAE A,F9,.94,ETA CASSIOPEIAE B,K6,.58
160 DATA SIGMA DRACONIS,G9,.82,36 OPHIUCHI A,K2,.77
170 DATA 36 OPHIUCHI B,K1,.76,HR 7703,K2,.76
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World Builder, continued...

```
 180 DATA DELTA PAVONIS,G7,.98,82 ERIDANI,G5,.91
 190 DATA BETA HYDRI,G1,1.23,HR 8832,K3,.74
 200 DATA SIRIUS,A1,23,CANOPUS,F0,130,VEGA,A0,52,ARCTURUS,K2,100
 210 DATA RIGEL,B8,52000,CAPELLA,G8,145,PROCYON,F5,7.6
 220 DATA ACHERNAR,B5,1000,ALTAIR,A7,10,BETELGEUSE,M2,8300
 230 DATA ALDEBARAN,K5,160,SPICA,B1,760,ANTARES,M1,830
 240 DATA POLLUX,K0,33,FOMALHAUT,A3,13,BETA CRUCIS,B0,8300
 250 DATA DENEB,A2,52000,REGULUS,B7,160,BARNARD'S STAR,M5,.00044
 260 CLS:PRINT"WORLD BUILDER"
 270 PRINT"ENTER THE NUMBER FOR THE OPTION YOU WANT"
 280 PRINT:PRINT"1....USE A KNOWN STAR"
 290 PRINT"2....USE A STAR NOT ON LIST"
 300 PRINT"3....LIST KNOWN STARS"
 310 PRINT"4....QUIT"
 320 INPUT"YOUR CHOICE";A
 330 IF A<1 OR A>4 GOTO 260
 340 ON A GOTO 410  ,550  ,370  ,350
 350 INPUT"ARE YOU SURE YOU WANT TO QUIT";A$
 360 IF ASC(A$)=89 THEN END ELSE GOTO 260
 370 CLS:PRINT"I KNOW THE FOLLOWING STARS"
 380 FOR I=1TO 12
 390 PRINTS$(I);TAB(20);S$(I+12);TAB(40);S$(I+24)
 400 NEXT I
 410 INPUT"WHICH STAR SHOULD I USE";S$
 420 IF S$="NONE" OR S$="" THEN 260
 430 FOR I=1TO 36
 440 IF S$=S$(I) THEN SK=I:GOTO 470
 450 NEXT I
 460 PRINT"I DON'T KNOW THAT STAR" : GOTO 270
 470 SC=VAL(RIGHT$(SS$(SK),1))/10
 480 S1$=LEFT$(SS$(SK),1)
 490 FOR I=1TO7:IF S1$=SC$(I) THEN J=I:GOTO 510
 500 NEXT I
 510 MS=SM(SK):L=LS(SK):AS=(MS[-2.5)*10
 520 P=(1.25-MS/(L[.285714))/.005
 530 IF P/100*AS>10 THEN P=1000/AS
 540 GOTO 740
 550 INPUT"WHAT IS THE STAR'S NAME";S$
 560 INPUT"WHAT IS THE STAR'S SPECTRAL CLASS";S1$
 570 IF S1$<>"" GOTO 640
 580 INPUT"WHAT IS THE ABSOLUTE MAGNITUDE (SUN=4.85)";M
 590 L=EXP(1.94-.4*M): MS=L[.285714
 600 FOR I=1TO7:IF M(I)<MS THEN J=I-1:GOTO 620
 610 NEXT I
 620 S1$=SC$(I-1):SC=INT((MS-M(J))/(M(I)-M(J)))/10
 630 GOTO 680
 640 SC=VAL(RIGHT$(S1$,1))/10 : S1$=LEFT$(S1$,1)
 650 FOR I=1TO7:IF S1$=SC$(I) THEN J=I:GOTO 670
 660 NEXT I:PRINT"I DON'T KNOW THAT CLASS":GOTO 560
 670 MS=M(J)-SC*(M(J)-M(J+1))
 680 AS=(MS[-2.5)*10
 690 PRINTS$;" HAS AN EXPECTED LIFE OF ";AS;" BILLION YEARS"
 700 INPUT"WHAT PERCENT (1-100) HAS ALREADY PASSED";P
 710 IF P/100*AS>12 PRINT"THE BIG BANG OCCURED 12 BILLION YEARS AGO.":
     INPUT"IS THIS WHAT YOU WANT";A$:IF ASC(A$)<>89 THEN 690
 720 MS=MS*(1.25-.005*P)
 730 L=MS[3.5
 740 TS=6000*MS[.35
 750 DS=MS[.3333
 760 CLS:PRINT"STELLAR DATA"
 770 PRINT"THE SELECTED STAR, ";S$;", IS A ";S1$;SC*10;" STAR"
 780 IF SC>.75 PRINT"IS ";C$(J+1) : GOTO 810
 790 IF SC<.25 PRINT"IS ";C$(J) : GOTO 810
 800 PRINT"IS BETWEEN ";C$(J);" AND ";C$(J+1)
 810 PRINT"HAS A MASS OF ";MS;" TIMES THAT OF THE SUN"
 820 PRINT"IT IS ";L;" TIMES AS BRIGHT AS THE SUN"
 830 PRINT"THE STAR HAS AN EXPECTED LIFESPAN OF";AS;" BILLION YEARS
 840 PRINT"OF WHICH IT HAS LIVED";P;"% OR ABOUT";AS*P/100;" BILLION YEARS."
 850 IF P>95 PRINT"  THE STAR IS IN ITS DEATH THROES."
 860 PRINT"IT HAS A SURFACE TEMPERATURE OF ";TS;" DEGREES KELVIN"
 870 IF J+SC<2.5 OR J+SC>7 PRINT"AND IS BELIEVED TO HAVE NO PLANETS":GOTO
     890
 880 PRINT"AND MAY HAVE PLANETS"
 890 PRINT"THIS STAR WILL DIE AS A ";
 900 IF MS<1.5 PRINT"WHITE DWARF": GOTO 940
 910 IF MS<4.0 PRINT"NEUTRON STAR": GOTO 940
 920 IF MS<10. PRINT"NEUTRON STAR AFTER GOING NOVA":GOTO 940
 930 PRINT"BLACK HOLE AFTER GOING SUPER NOVA"
 940 INPUT"ANOTHER STAR";A$
 950 IF ASC(A$)=89 THEN 260
 960 P=P/100
 970 CLS:PRINT"THE MAIN PLANET OF INTEREST"
 980 PRINT"THE EARTH HAS AN AVERAGE SURFACE TEMPERATURE OF 60 DEGREES"
 990 INPUT"WHAT SURFACE TEMPERATURE WOULD YOU LIKE";TP:TP=TP+460
1000 INPUT"DESIRED SURFACE GRAVITY (EARTH=1)";G
1010 IF G<=0 PRINT"THE PLANET MUST HAVE SOME GRAVITY":GOTO 1000
1020 RP=SQR(L/(TP/520)[4)
1030 IF RP<MS/5 PRINT"THIS PLANET IS TOO CLOSE TO BE STABLE.":GOTO 980
```

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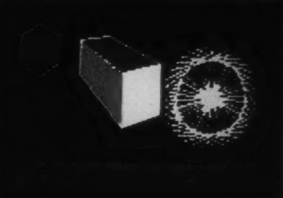

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1040 PP=SQR(RP[3/MS)
1050 IS=L/RP[2
1060 RM=.00012*TS
1070 RX=.06452*EXP(.0005*TS)
1080 SA=DS/RP
1090 INPUT"HOW BIG SHOULD THE PLANET BE RELATIVE TO EARTH";D
1100 M=G*D[2
1110 IF M<.055 PRINT"THE PLANET WON'T RETAIN AN OXYGEN ATMOSPHERE"
1120 IF M>17.6 PRINT"THE PLANET WON'T LOSE ITS HYDROGEN ATMOSPHERE"
1130 PRINT"EARTH'S ORBIT HAS AN ECCENTRCITY OF .01672
1140 INPUT"WHAT IS THE ORBITAL ECCENTRICITY ( <1)";EC
1150 IF EC>1 THEN 1140
1160 CA=(1-EC)*RP : FA=(1+EC)*RP
1170 INPUT"HOW DOES THE AXIS TILT (EARTH=23.5 DEGREES)";TI
1180 IF TI<0 OR TI>90 THEN 1170
1190 INPUT"HOW MANY MOONS DOES THE PLANET HAVE";MN
1200 IF MN>10 PRINT"FOR CONVENIENCE WE'LL LIMIT THIS TO 10":MN=10
1210 MM=1000:H=0:R=56*G
1220 IF MN<=0 THEN 1320
1230 FOR I=1TOMN
1240 PRINT"MASS OF MOON #";I;" (OUR MOON=1)";:INPUT MN(I)
1250 INPUT"ORBIT (OUR MOON=30)";MR(I)
1260 IF MR(I)<3*G PRINT"THE MOON IS TOO CLOSE AND WILL BREAK UP":GOTO 1250
1270 IF MR(I)>56*G PRINT"THE MOON IS TOO FAR AND WILL DRIFT AWAY":GOTO
     1250
1280 MP(I)=SQR(MR(I)[3/M)*4
1290 IF MR(I)<R THEN MM=MP(I):R=MR(I)
1300 H=MN(I)*.01235/(MR(I)[3)+H
1310 NEXT I
1320 H2=.85*D[4/M*(MS*333500/(11759*RP)[3+H)
1330 DA=1.75926E+06*H2*14+10
1340 IF DA>MM THEN DA=MM
1350 CLS:PRINT"THIS PLANET'S DAY SHOULD BE ABOUT";DA;" HOURS LONG."
1360 PRINT"THAT MAKES ITS YEAR";8766/DA*PP;"DAYS LONG. WITH A TILT OF";TI
1370 HI=(1+.025*DA/24)*TP-460 : LO=(1-.025*DA/24)*TP-460
1380 IF LO<-460 THEN LO=-460
1390 PRINT"TODAY'S HIGH TEMPERATURE SHOULD BE";HI;" DEGREES F."
1400 PRINT"TONIGHT'S EXPECTED LOW IS";LO;" DEGREES F."
1410 SH=HI+1.9*TI*(1+EC)[2 : LL=LO-1.9*TI/(1+EC)[2
1420 IF LL<-460 THEN LL=-460
1430 PRINT"THIS SUMMER WE EXPECT IT TO GET UP TO";SH
1440 PRINT"THIS WINTER IT SHOULD DROP DOWN TO";LL
1450 IF SH<32 OR LL>175 PRINT"THERE ARE TIMES WHEN NO LIQUID WATER
     EXISTS."
1460 IF MN<=0 GOTO 1600
1470 IF MN=1 GOTO 1570
1480 FOR I=1TO MN:F=0:FOR K=1TOMN-I
1490 IF MR(K+1)>=MR(K) THEN 1540
1500 T=MR(K):MR(K)=MR(K+1):MR(K+1)=T
1510 T=MN(K):MN(K)=MN(K+1):MN(K+1)=T
1520 T=MP(K):MP(K)=MP(K+1):MP(K+1)=T
1530 F=1
1540 NEXT K
1550 IF F=0 THEN 1570
1560 NEXT I
1570 PRINT:PRINT"YOUR SELECTED SYSTEM OF MOONS"
1580 PRINT"ORBIT","MASS","PERIOD"
1590 FOR I=1TOMN:PRINTMR(I),MN(I),MP(I);"HOURS ";MP(I)/DA;" DAYS":NEXTI
1600 INPUT"WANT A DIFFERENT SET OF MOONS";A$
1610 IF ASC(A$)=89 THEN 1190
1620 CLS:PRINT"PLANETARY DATA"
1630 PRINT"OUR PRINCIPAL PLANET OF INTEREST HAS AN AVERAGE SURFACE
1640 PRINT"TEMPERATURE OF";TP-460;" DEGREES F. THIS REQUIRES AN ORBIT"
1650 PRINT"OF";RP;" ASTRONOMICAL UNITS (";RP*93;" MILLION MILES)"
1660 PRINT"CLOSEST APPROACH =";CA;" AU: GREATEST DISTANCE =";FA;" AU"
1670 PRINT"THIS ALSO MEANS IT HAS A YEAR THAT IS";PP;" YEARS LONG"
1680 PRINT"THE STAR APPEARS";
1690 IF SA>1.5 OR SA <.75 PRINT" MUCH";
1700 IF SA >1. PRINT" LARGER";: ELSE PRINT" SMALLER";
1710 PRINT" THAN OUR SUN."
1720 IF G>.95 AND G<1.05 PRINT"GRAVITY IS ESSENTIALLY THE SAME AS EARTH'S"
     :GOTO 1780
1730 PRINT"SINCE OUR PLANET HAS A GRAVITY";:IF G<1 THEN 1760
1740 PRINT" GREATER THAN EARTH'S WE EXPECT"
1750 PRINT"A THICKER ATMOSPHERE. THERE IS GREATER TECTONIC ACTION AND MORE
      GREATER RESISTING FORCES. THUS WE EXPECT MORE CONTINENTS AND SHORTER
      MOUNTAINS. EARTHQUAKES SHOULD BE MORE FREQUENT AND MORE SEVERE.
     ":GOTO1780
1760 PRINT" LESS THAN EARTH'S WE EXPECT"
1770 PRINT"A THINNER ATMOSPHERE. THERE IS LESS TECTONIC ACTION AND LESS
     RESISTANCE. THUS WE EXPECT FEWER MOUNTAINS BUT THEY MAY BE MUCH
     TALLER. EARTHQUAKES, IF ANY, WILL BE LESS SEVERE."
1780 PRINT"A GRAVITY OF ";G;" MEANS THAT IF YOU WEIGH 200 POUNDS"
1790 PRINT"YOU WOULD WEIGH";G*200;" ON OUR PLANET"
1800 INPUT"WOULD YOU LIKE A NEW GRAVITY";A$
1810 IF ASC(A$)=89 THEN 1000
1820 CLS:PRINT"LIFE ???"
1830 IF M<.055 OR M>17.6 PRINT"BECAUSE OF THE BAD ATMOSPHERE ":GOTO2080
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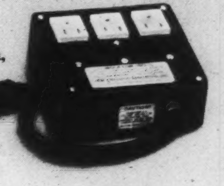

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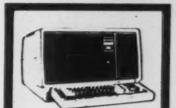

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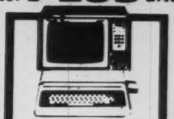

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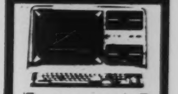

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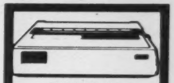

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World Builder, continued...

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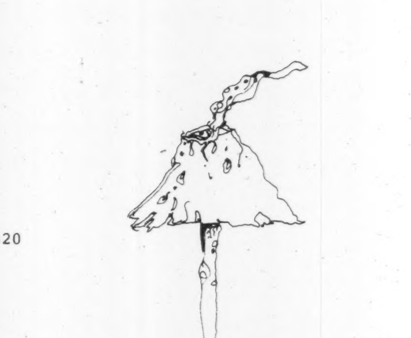
1840 IF RP<RM OR RP>RX PRINT"BECAUSE OF THE LEVEL OF RADIATION ":GOTO2080
1850 IF SH<32 OR LL>175 PRINT"SINCE LIQUID WATER NEVER OCCURS ":GOTO 2080
1860 IF AS*P <1.5 PRINT"THE PLANET IS TOO YOUNG TO HAVE EVOLVED LIFE":GOTO 2080
1870 IF P>.95 PRINT"SINCE THE STAR IS IN ITS DEATH THROES ":GOTO 2080
1880 PRINT"THERE MAY BE SOME ";
1890 IF AS*P<2*G PRINT"BACTERIA AND BLUE GREEN ALGAE":GOTO2060
1900 IF AS*P<3*G PRINT"SINGLE CELL LIFE WITH NUCLEUS":GOTO2060
1910 IF AS*P<4*G PRINT"SIMPLE MULTICELLED LIFE":GOTO2060
1920 IF AS*P<4.4*G PRINT"WATER VERTEBRATES AND LAND PLANTS":GOTO2060
1930 PRINT"MAJOR LAND ANIMALS AND PERHAPS INTELLIGENCE"
1940 IF G<.95 THEN 1990
1950 IF G<1.05 THEN 2030
1960 PRINT"HIGHER GRAVITY MEANS A THICK ATMOSPHERE WHICH WILL SUPPORT LARGEBIRDS. IT ALSO MEANS THAT SHORT FALLS
     COULD BE FATAL SO REACT IONTIMES SHOULD BE VERY SHORT. ALL LIFE FORMS WILL BE SHORTER AND  STOCKIER THAN
     ON EARTH."
1970 IF G>1.2 PRINT"THERE ARE NO TWO LEGGED ANIMALS."
1980 PRINT"THE THICK ATMOSPHERE IMPROVES SOUND TRANSMISSION SO THE ANIMALS MAY WILL RELY MORE ON HEARING.":
     GOTO2030
1990 PRINT"LOWER GRAVITY MEANS A THINNER ATMOSPHERE. BIRDS, IF ANY, WILL   HAVE LARGER WINGS. ALL LIFE FORMS
     SHOULD BE TALLER AND MORE SLENDER THAN ON EARTH."
2000 PRINT"IT THERE PROBABLY ARE MANY TWO LEGGED ANIMALS."
2010 PRINT"THE THIN ATMOSPHERE HURTS SOUND TRANSMISSION SO ANIMALS WILL    EITHER HAVE LARGE EARS OR NONE.
     LUNGS WILL BE MUCH LARGER."
2020 IF TP>75 PRINT"SOME FORM OF RADIATION PROTECTION WILL BE NECESSARY."
2030 IF SA<.75 PRINT"BECAUSE OF THE SMALL SUN, WE EXPECT ANIMALS TO HAVE LARGE EYES  OR TO RELY ON OTHER
     SENSES."
2040 IF SA>1.5 PRINT"UNLESS THE ATMOSPHERE IS OBSCURED, WE EXPECT RELIANCE ON SIGHT  USING RELATIVELY SMALL
     EYES."
2050 IF HI-LO>50 PRINT"EXTREME TEMPERATURE VARIATIONS FAVOR UNDERGROUND AND UNDERWATER LIFEFORMS."
2060 IF(TP-460)<32 OR (TP-460)>86 OR G>1.5 OR G<.68 OR M<.4 OR M>2.35 OR DA>96 OR SH>120 OR LL<-30 OR HI>110
     OR LO<-10 THEN HM=0 ELSE HM =1
2070 GOTO 2090
2080 PRINT"THERE APPEARS TO BE NO LIFE ON THIS PLANET."
2090 PRINT"THIS PLANET ";:IF HM=1 PRINT"MIGHT BE";:ELSE PRINT"WOULDN'T BE";
2100 PRINT" CONSIDERED HABITABLE BY MAN."
2110 INPUT"WANT ANOTHER PLANET";A$
2120 IF ASC(A$)=89 THEN 970
2130,CLS:PRINT"OTHER PLANETS"
2140 INPUT"HOW MANY PLANETS WOULD YOU LIKE";NP
2150 IF NP>15 PRINT"FOR CONVENIENCE WE'LL LIMIT THIS TO 15":NP=15
2160 IF NP<=1 THEN 2600
2170 AM=1180/SQR(MS)-M*SQR(RP)
2180 R(1)=RP:MP(1)=M
2190 FOR I=2TONP
2200 CLS
2210 PRINT"OUR SOLAR SYSTEM IS LAID OUT LIKE THIS:"
2220 PRINT"PLANET       MASS      DISTANCE FROM SUN"
2230 PRINT"MERCURY      .055        .387"
2240 PRINT"VENUS        .815        .723"
2250 PRINT"EARTH         1.0         1.0"
2260 PRINT"MARS         .108       1.524"
2270 PRINT"JUPITER     317.9       5.203"
2280 PRINT"SATURN       95.2       9.539"
2290 PRINT"URANUS       14.6       19.18"
2300 PRINT"NEPTUNE      17.2       30.06"
2310 PRINT"PLUTO        .100       39.44"
2320 PRINT"MASS FOR PLANET #";I;:INPUTMP(I)
2330 IF MP(I)>1000 PRINT"A BODY THIS LARGE WOULD BECOME A STAR.":GOTO 2320
2340 INPUT"DISTANCE FROM STAR";R(I)
2350 IF R(I)<MS/5  PRINT"PLANET IS TOO CLOSE TO SUN":GOTO2340
2360 IF R(I)>56*MS PRINT"PLANET IS TOO FAR FROM THE SUN":GOTO 2340
2370 FOR K=1TOI-1:IF R(K)>.9*R(I) AND R(K)<1.1*R(I) THEN 2430
2380 NEXT K
2390 A1=MP(I)*SQR(R(I))
2400 IF A1>AM PRINT"THE PLANET HAS TOO MUCH MASS FOR SYSTEM":GOTO 2210
2410 AM=AM-A1
2420 NEXT I:GOTO 2450
2430 PRINT"THIS PLANET IS TOO CLOSE TO OTHER PLANETS TO HAVE A STABLE ORBIT"
2440 GOTO 2210
2450 FOR I=1TONP:F=0:FOR K=1TONP-I
2460 IF R(K+1)>=R(K) THEN 2500
2470 T=R(K):R(K)=R(K+1):R(K+1)=T
2480 T=MP(K):MP(K)=MP(K+1):MP(K+1)=T
2490 F=1
2500 NEXT K
2510 IF F=0 THEN 2530
2520 NEXT I
2530 PRINT"PLANET #        MASS            ORBIT"
2540 FOR I=1TONP
2550 PRINTI,MP(I),R(I);
2560 IF R(I)>RM AND R(I)<RX AND MP(I)>.055 AND MP(I)<17.6 PRINT"LIFE?" ELSE PRINT" "
2570 NEXT I
2580 INPUT"WOULD YOU LIKE TO TRY ANOTHER SYSTEM";A$
2590 IF ASC(A$)=89 THEN 2130
2600 INPUT"WOULD YOU LIKE TO TRY ANOTHER STAR";A$
2610 IF ASC(A$)=89 THEN 260
2620 END
```



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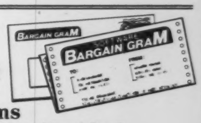

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World Builder, continued...

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                **
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WORLD BUILDER
ENTER THE NUMBER FOR THE OPTION YOU WANT

1....USE A KNOWN STAR
2....USE A STAR NOT ON LIST
3....LIST KNOWN STARS
4....QUIT
YOUR CHOICE? 3_



I KNOW THE FOLLOWING STARS
SOL                 HR 7703             ACHERNAR
ALPHA CENTURI A     DELTA PAVONIS       ALTAIR
ALPHA CENTURI B     82 ERIDANI          BETELGEUSE
EPSILON ERIDANI     BETA HYDRI          ALDEBARAN
TAU CETI            HR 8832             SPICA
70 OPHIUCHI A       SIRIUS              ANTARES
70 OPHIUCHI B       CANOPUS             POLLUX
ETA CASSIOPEIAE A   VEGA                FOMALHAUT
ETA CASSIOPEIAE B   ARCTURUS            BETA CRUCIS
SIGMA DRACONIS      RIGEL               DENEB
36 OPHIUCHI A       CAPELLA             REGULUS
36 OPHIUCHI B       PROCYON             BARNARD'S STAR
WHICH STAR SHOULD I USE? TAU CETI_



STELLAR DATA
THE SELECTED STAR, TAU CETI, IS A G 8  STAR
IS ORANGE
HAS A MASS OF  .82  TIMES THAT OF THE SUN
IT IS  .499285  TIMES AS BRIGHT AS THE SUN
THE STAR HAS AN EXPECTED LIFESPAN OF 16.4235  BILLION YEARS
OF WHICH IT HAS LIVED 50.0001 % OR ABOUT 8.21175  BILLION YEARS.

IT HAS A SURFACE TEMPERATURE OF  5597.4  DEGREES KELVIN
AND MAY HAVE PLANETS
THIS STAR WILL DIE AS A WHITE DWARF
ANOTHER STAR? NO_




THE MAIN PLANET OF INTEREST
THE EARTH HAS AN AVERAGE SURFACE TEMPERATURE OF 60 DEGREES
WHAT SURFACE TEMPERATURE WOULD YOU LIKE? 50
DESIRED SURFACE GRAVITY (EARTH=1)? .85
HOW BIG SHOULD THE PLANET BE RELATIVE TO EARTH? .75
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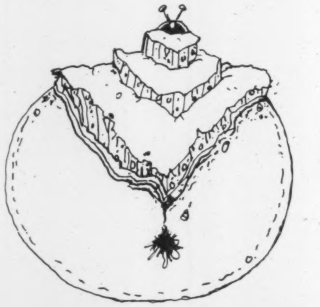

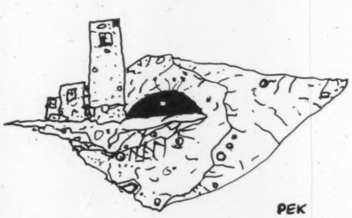

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EARTH'S ORBIT HAS AN ECCENTRCITY OF .01672
WHAT IS THE ORBITAL ECCENTRICITY ( <1)? .02
HOW DOES THE AXIS TILT (EARTH=23.5 DEGREES)? 10
HOW MANY MOONS DOES THE PLANET HAVE? 2
MASS OF MOON # 1  (OUR MOON=1)? .5
ORBIT (OUR MOON=30)? 20
MASS OF MOON # 2  (OUR MOON=1)? .2
ORBIT (OUR MOON=30)? 40_


THIS PLANET'S DAY SHOULD BE ABOUT 27.1068  HOURS LONG.
THAT MAKES ITS YEAR 224.842 DAYS LONG. WITH A TILT OF 10
TODAY'S HIGH TEMPERATURE SHOULD BE 64.4005  DEGREES F.
TONIGHT'S EXPECTED LOW IS 35.5995  DEGREES F.
THIS SUMMER WE EXPECT IT TO GET UP TO 84.1681
THIS WINTER IT SHOULD DROP DOWN TO 17.3373

YOUR SELECTED SYSTEM OF MOONS
ORBIT            MASS             PERIOD
 20               .5               517.41 HOURS  19.0878  DAYS
 40               .2               1463.45 HOURS  53.9886  DAYS
WANT A DIFFERENT SET OF MOONS? NO_


PLANETARY DATA
OUR PRINCIPAL PLANET OF INTEREST HAS AN AVERAGE SURFACE
TEMPERATURE OF 50  DEGREES F. THIS REQUIRES AN ORBIT
OF .734582  ASTRONOMICAL UNITS ( 68.3162  MILLION MILES)
CLOSEST APPROACH = .719891  AU: GREATEST DISTANCE = .749274  AU
THIS ALSO MEANS IT HAS A YEAR THAT IS .695271  YEARS LONG
THE STAR APPEARS LARGER THAN OUR SUN.
SINCE OUR PLANET HAS A GRAVITY LESS THAN EARTH'S WE EXPECT
A THINNER ATMOSPHERE. THERE IS LESS TECTONIC ACTION AND LESS
RESISTANCE. THUS WE EXPECT FEWER MOUNTAINS BUT THEY MAY BE MUCH
TALLER. EARTHQUAKES, IF ANY, WILL BE LESS SEVERE.
A GRAVITY OF  .85  MEANS THAT IF YOU WEIGH 200 POUNDS
YOU WOULD WEIGH 170  ON OUR PLANET
WOULD YOU LIKE A NEW GRAVITY? NO_


LIFE ???
THERE MAY BE SOME MAJOR LAND ANIMALS AND PERHAPS INTELLIGENCE
LOWER GRAVITY MEANS A THINNER ATMOSPHERE. BIRDS, IF ANY, WILL
HAVE LARGER WINGS. ALL LIFE FORMS SHOULD BE TALLER AND MORE
SLENDER THAN ON EARTH.
IT THERE PROBABLY ARE MANY TWO LEGGED ANIMALS.
THE THIN ATMOSPHERE HURTS SOUND TRANSMISSION SO ANIMALS WILL
EITHER HAVE LARGE EARS OR NONE. LUNGS WILL BE MUCH LARGER.
SOME FORM OF RADIATION PROTECTION WILL BE NECESSARY.
THIS PLANET MIGHT BE CONSIDERED HABITABLE BY MAN.
WANT ANOTHER PLANET? NO_
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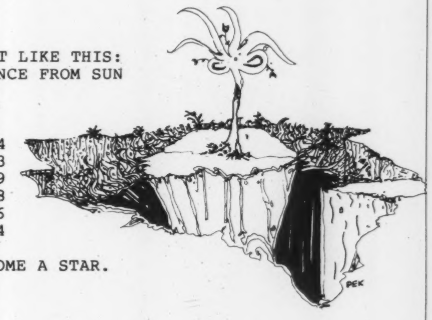

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OUR SOLAR SYSTEM IS LAID OUT LIKE THIS:
PLANET        MASS        DISTANCE FROM SUN
MERCURY       .055           .387
VENUS         .815           .723
EARTH          1.0            1.0
MARS          .108           1.524
JUPITER      317.9           5.203
SATURN        95.2           9.539
URANUS        14.6           19.18
NEPTUNE       17.2           30.06
PLUTO         .100           39.44
MASS FOR PLANET # 2 ? 2000
A BODY THIS LARGE WOULD BECOME A STAR.
MASS FOR PLANET # 2 ? 400
DISTANCE FROM STAR? 4_


PLANET #       MASS            ORBIT
 1              .8              .5
 2              .478125         .734582 LIFE?
 3              .45             .9 LIFE?
 4              10              40
WOULD YOU LIKE TO TRY ANOTHER SYSTEM? NO
WOULD YOU LIKE TO TRY ANOTHER STAR? NO
READY
```

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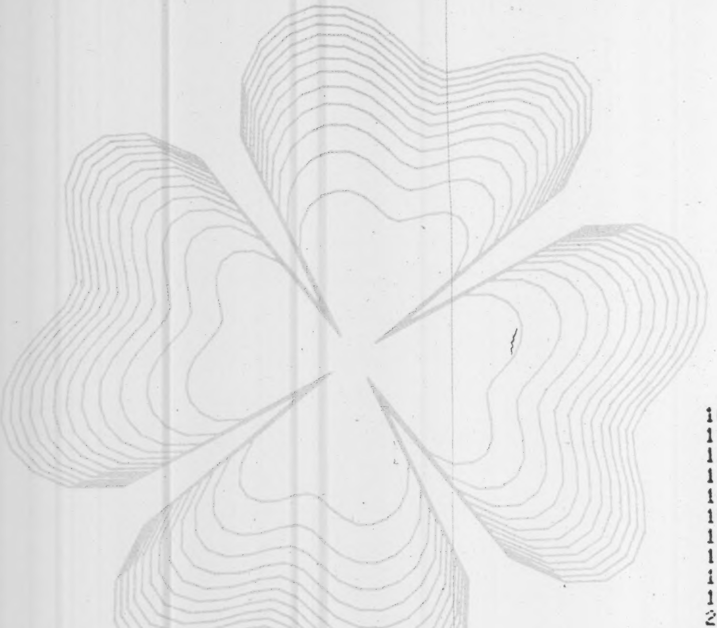
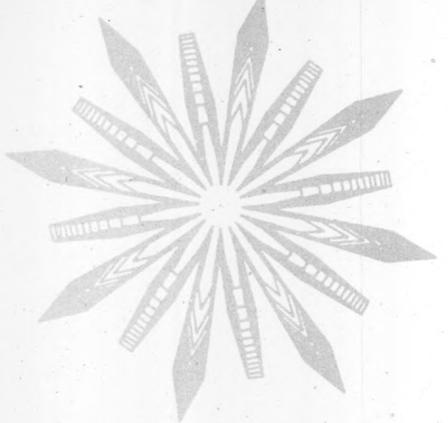




Computer Art For The Tektronix 4052

```
100 REM SINE POWER
110 PAGE
120 SET DEGREES
130 PRINT "ENTER P; P MUST BE 1 OR 2."
140 INPUT P
150 PRINT "ENTER U"
160 INPUT U
170 PRINT "ENTER S."
180 INPUT S
190 PRINT "ENTER K."
200 INPUT K
210 PRINT "ENTER M."
220 INPUT M
230 PRINT "ENTER T."
240 INPUT T
250 PRINT "ENTER L."
260 INPUT L
270 PRINT "ENTER N."
280 INPUT N
290 PRINT "ENTER Q."
300 INPUT Q
310 PRINT "ENTER D."
320 INPUT D
330 PRINT "ENTER G."
340 INPUT G
350 PRINT "ENTER T1"
360 INPUT T1
370 Z1=0
380 U1=INT(360/G)+10
390 DIM X(U1),Y(U1)
400 PAGE
410 FOR B=D TO 360 STEP D
420 V=1
430 FOR A=0 TO 360 STEP G
```

Joe Jacobson

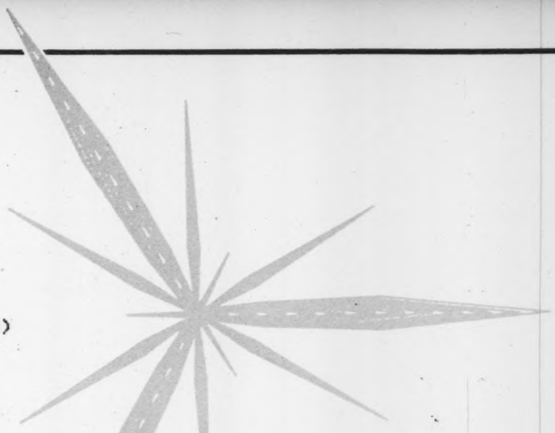
In this article I discuss my Sine Power program. This routine is similar in structure to the polar coordinate programs I have presented in recent issues of *Creative Computing.* The radius is computed as the weighted sum of powers of sinusoids, or as a root of the absolute value of the weighted sum (depending on the values selected for parameters U and P).

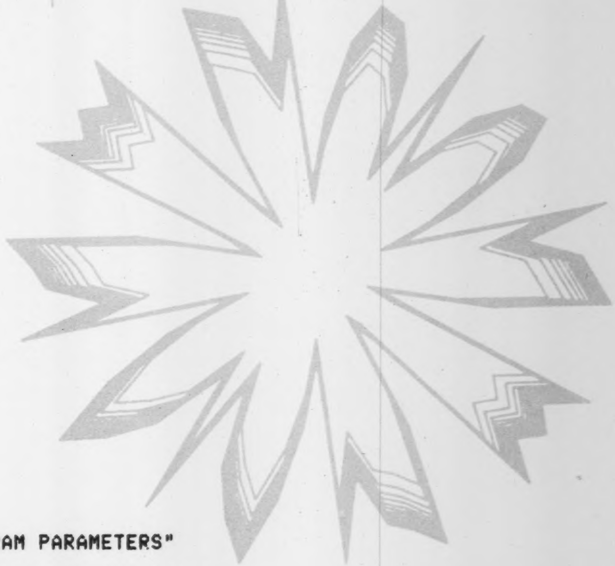
Joe Jacobson, 675 E. Street Road, Apt. 1009, Warminster, PA 18974

The use of powers of sinusoids was suggested by a fellow computer artist and co-worker, Joel Wexler, and is also a natural extension of the Sine Product program *(Creative Computing,* May 1983). As in the Sine Product program, Sine Power incorporates automatic scaling.

The program prompts the user to enter certain input parameters from the keyboard. The parameters M and N are exponents (powers) of the sinusoids. K and L are angular frequency coefficients in the arguments of the sinusoids. S and T are amplitude weights of the sinusoidal terms. Q is the exponent of the absolute value; if Q has a value between 0 and 1, the result is a root. D is the increment in radius between successive angular sweeps. G is the increment in angle within a sweep.

If you want a list of input parameter values at the bottom of the picture, set





```
440 GOSUB 480
450 V=V+1
460 NEXT A
470 GO TO 590
480 R=B*(S*SIN(K*A)↑M+T*COS(L*A)↑N)
490 IF P=1 THEN 540
500 IF U=2 THEN 530
510 R=B*ABS(R)↑Q
520 GO TO 540
530 R=ABS(R)↑Q
540 IF B>D THEN 560
550 Z1=R MAX Z1
560 X(V)=R*COS(A)
570 Y(V)=R*SIN(A)
580 RETURN
590 IF T1=2 THEN 620
600 VIEWPORT 22,108,14,100
610 GO TO 630
620 VIEWPORT 15,115,0,100
630 Z2=Z1+Z1/1000
640 IF P=1 THEN 700
650 IF U=1 THEN 680
660 Z2=Z2*(360/D)↑Q
670 GO TO 710
680 Z2=Z2*(360/D)↑(Q+1)
690 GO TO 710
700 Z2=Z2*(360/D)
710 WINDOW -Z2,Z2,-Z2,Z2
720 FOR Q1=1 TO V-1
730 IF Q1>1 THEN 760
740 MOVE X(Q1),Y(Q1)
750 GO TO 770
760 DRAW X(Q1),Y(Q1)
770 NEXT Q1
780 NEXT B
790 IF T1=1 THEN 810
800 END
810 WINDOW 0,130,0,100
820 VIEWPORT 0,130,0,100
830 MOVE 0,10
840 PRINT "              SINE POWER PROGRAM PARAMETERS"
850 MOVE 0,5
860 PRINT "     (P,U,S,K,M,T,L,N,Q,D,G) = (";P;",";U;",";S;",";
870 PRINT K;",";M;",";T;",";L;",";N;
880 PRINT ",";Q;",";D;",";G;")"
890 INPUT J$
900 T1=2
910 GO TO 400
```

T1 equal to 1. After the plot is complete, with the parameter list, clear the screen and hit RETURN. You will get a "clean" plot (without the parameter list). If you don't want a parameter list at all, set T1 equal to 2.

Table 1 lists ranges of values that seem to give good results. Some values outside these intervals may also work well.

In a future issue of *Creative Computing* I will describe a completely different type of polar coordinate computer art program. □

Table 1. Suggested Parameter Values.

Parameter	Range of Values	
	From	To
U*	1	2
P*	1	2
S	− ∞	+ ∞
K	6	60
M**	1	+ ∞
T	− ∞	+ ∞
L	6	60
N**	1	+ ∞
Q	0	1
D	30	50
G***	5	15
T1*	1	2

* U, P, and T1 must each be either 1 or 2.
** M and N must be positive integers or 0.
*** G must be +2.4 or greater.

Rabbits and Foxes: Biological Population Cycles

C.J.G. Raw

A very simple model of population oscillations in host-parasite or prey-predator systems was developed by Lotka and Volterra in the 1920s, and is still useful today. A good reference to the mathematical background is G. Murdie's article on "Population Models" (chapter 8 of J.G. Andrews and R.R. McLone *Mathematical Modelling*, Butterworths, Inc., Boston, 1976).

A very simple program (in Applesoft Basic) for demonstrating this model is presented here. It illustrates how very elementary programming may sometimes be used in dealing with sophisticated scientific ideas.

The Lotka-Volterra model may be visualized as follows. I am using the rabbits-and-foxes prey-predator system as an example.

$$\begin{aligned} A + X &\rightarrow 2X \\ X + Y &\rightarrow 2Y \\ Y &\rightarrow D \end{aligned}$$

Here, A represents the (constant) food supply of the rabbits whose population (X) increases in the first step. The foxes prey on the rabbits to increase the fox population (Y) in step two. Finally, when the rabbit population has been reduced sufficiently, and the foxes (which are assumed to eat only rabbits) have become too numerous, the foxes begin to die off in step three for lack of food. This makes it possible for the rabbit population to begin increasing again via step one. The whole population cycles, then repeats itself.

Although this model is somewhat simplified (we ignore the effect of weather on the rabbits' food supply, and we assume foxes live only on rabbits), it is still widely used as a basis for the study of fluctuating populations in prey-predator or host-parasite systems.

The Lotka-Volterra differential equations express the time rate of increase of the populations X and Y (rabbits and foxes, respectively). It is not the purpose here to explain differential equations, but I list them below for the calculus experts:

$$(DX/DT) = (K1 - K2*Y)*X$$
$$(DY/DT) = (K2*X - K3)*Y$$

In these equations, K1 represents the intrinsic rate of increase of rabbits which is diminished in the first equation by a term proportional to the number of foxes (K2*Y). DX represents the increase in rabbit population in the very small time interval DT, with a similar interpretation of DY.

In the second equation above, the rate of increase of foxes is proportional to the rabbit population (K2*X) diminished by the death rate (K3) of foxes. Both rates are proportional overall to the parent populations (X and Y themselves).

Note that in the absence of foxes, Y=0, the rabbit population grows exponentially:

$DX/DT = K1*X$

which integrates to (again for the calculus experts)

$X = X_0 *EXP(K1*T)$

where X_0 is the original rabbit population (at time T=0).

The two Lotka-Volterra equations are solved in the general case by computing the increments (DX and DY) for a very small time interval, DT = .0001, and adding these to the starting values of X and Y. This is repeated a very large number of times to compute how the populations of rabbits (X) and foxes (Y) change as time goes on.

The program listed here plots the population of foxes (Y) versus rabbits (X), using the high-resolution page 1 graphics screen of the Apple II computer. The initial values of the populations X and Y, and appropriate positive values of the rate coefficients (K1, K2, and K3), are entered by the program user.

Note that the populations should be scaled to fit the resolution along the axes.

For simplicity, I have assumed that the X population could vary from 1 to 279, and the Y population from 1 to 159.

Notice, also, that a steady state is possible. This occurs when the populations do not change with time, i.e. DX/DT = 0 and DY/DT = 0.

From the Lotka-Volterra equations, it follows that the steady state populations are X = K3/K2 and Y = K1/K2. The values of the K1, K2, and K3 should be chosen so that the steady state populations lie near the center of the screen. The rate coefficients and initial populations are displayed in the four lines of text at the bottom of the high-resolution page 1 screen.

I used a Silentype thermal printer to display both the listing and a typical RUN. It might be interesting for the reader to try other values for the initial populations and rate coefficients, just to see what happens.

My own interest in this model arose

C.J.G. Raw, Department of Chemistry, Saint Louis University, St. Louis, MO 63103.

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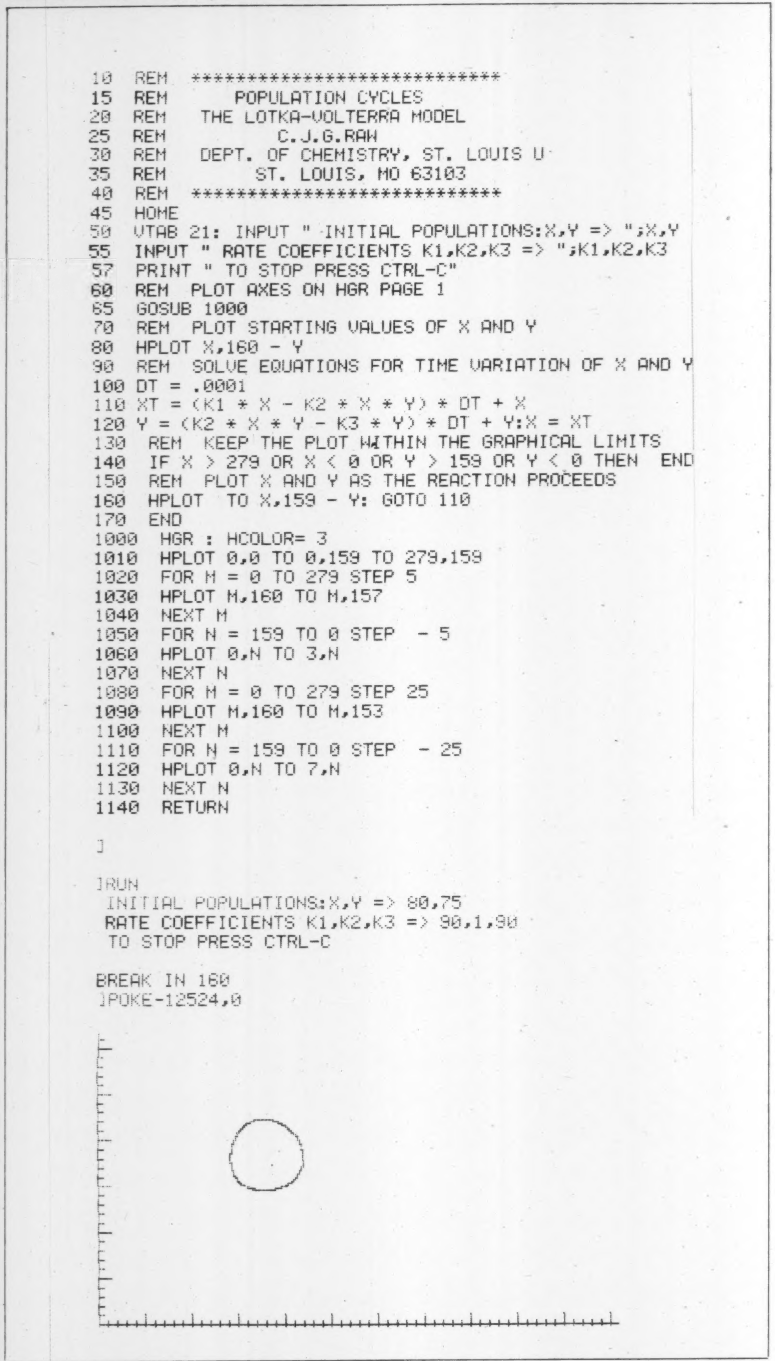

```
10  REM  ****************************
15  REM       POPULATION CYCLES
20  REM   THE LOTKA-VOLTERRA MODEL
25  REM           C.J.G.RAW
30  REM   DEPT. OF CHEMISTRY, ST. LOUIS U
35  REM         ST. LOUIS, MO 63103
40  REM  ****************************
45  HOME
50  VTAB 21: INPUT " INITIAL POPULATIONS:X,Y => ";X,Y
55  INPUT " RATE COEFFICIENTS K1,K2,K3 => ";K1,K2,K3
57  PRINT " TO STOP PRESS CTRL-C"
60  REM  PLOT AXES ON HGR PAGE 1
65  GOSUB 1000
70  REM  PLOT STARTING VALUES OF X AND Y
80  HPLOT X,160 - Y
90  REM  SOLVE EQUATIONS FOR TIME VARIATION OF X AND Y
100 DT = .0001
110 XT = (K1 * X - K2 * X * Y) * DT + X
120 Y = (K2 * X * Y - K3 * Y) * DT + Y:X = XT
130  REM  KEEP THE PLOT WITHIN THE GRAPHICAL LIMITS
140  IF X > 279 OR X < 0 OR Y > 159 OR Y < 0 THEN  END
150  REM  PLOT X AND Y AS THE REACTION PROCEEDS
160  HPLOT  TO X,159 - Y: GOTO 110
170  END
1000  HGR : HCOLOR= 3
1010  HPLOT 0,0 TO 0,159 TO 279,159
1020  FOR M = 0 TO 279 STEP 5
1030  HPLOT M,160 TO M,157
1040  NEXT M
1050  FOR N = 159 TO 0 STEP  - 5
1060  HPLOT 0,N TO 3,N
1070  NEXT N
1080  FOR M = 0 TO 279 STEP 25
1090  HPLOT M,160 TO M,153
1100  NEXT M
1110  FOR N = 159 TO 0 STEP  - 25
1120  HPLOT 0,N TO 7,N
1130  NEXT N
1140  RETURN

]

]RUN
 INITIAL POPULATIONS:X,Y => 80,75
 RATE COEFFICIENTS K1,K2,K3 => 90,1,90
 TO STOP PRESS CTRL-C

BREAK IN 160
]POKE-12524,0
```

from its application to oscillations in the concentrations of certain intermediate species in oscillatory chemical reactions. The model requires considerable extension to account satisfactorily for such chemical reactions, however. For the reader interested in such extensions to the chemical, biological and social sciences, an excellent reference is Nicolis and Prigogine's "*Self-Organizaton in Non-Equilibrium Systems*" (Wiley-Interscience, New York, 1977). Professor Prigogine won the Nobel Prize in chemistry for this work a few years ago. ☐

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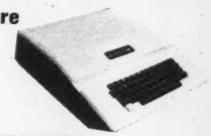

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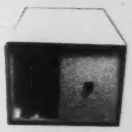

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outpost: atari

John J. Anderson

Among the hot topics in this month's edition of the Outpost, we will address two of the most frequently-asked questions about the Atari—one concerning hardware and the other concerning software. I'll show and tell you a bit about my recent trip west, and we'll talk a little politics as we did last month. We'll do a little dreaming, too. That's a busy docket, so let's get going. First the softer and fuzzier issues.

Quo Vadis Atari?

Last month I frankly shared with you my disappointment with some of the attitudes and decisions that have recently emanated from Atari. Some of my complaints had to do with the issue of compatibility: I felt Atari had blown it by not making its next-generation games machine compatible with its computers, as the categories are in fact beginning to merge, and in their hearts the 400 and 5200 are the very same machine. I suggested that Atari then compounded the error by creating a new computer that isn't very compatible with its own predecessors. I went on to criticize Atari's apparent hostility to third-party hardware and software development for its machines.

Last week, in a very soggy Sunnyvale, I aired these grievances to various folks at Atari. They listened politely, disagreed often, but did respond with one bit of good news—the Atari 1200 XL is going to undergo an overhaul. Just how extensive a redesign is to be inferred here is not clear yet, but the intention is to start listening, and that is a good intention indeed. Atari does not wish to be perceived as insensitive to the voice of its customers. It could certainly stand to prick up its ears a bit in the Home Computer Division, and now appears to be doing so.

The Thinking Man's Atari

Exactly what *would* we like to see in the way of an Atari 1200 XLE (*E* for enhanced)? Well, Atari, we're sure glad you asked, and we hope you're listening hard. We think you have the makings of a good machine in the 1200, but that somewhere along the line you lost the core philosophy that made the 400 and 800 the machines they are. And you need to take steps that will move the 1200 up not only into that core category, but beyond it. Don't sweat it—we can tell you exactly how:

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Home Computers

In the display room at Atari's Sunnyvale headquarters. All of Atari's new machines, coin-op, home video, and computers can be seen here.

The 1200 has a superlative keyboard, and that extra 16K is sure handy. It was nice of you to boost the chroma, but don't forget that many of your customers will be using the monitor output, and the current chroma level is ruinous to closed circuit reception. You went too far in reworking the operating system, as not even the *Atari Word Processor* will boot on the bowdlerized OS as it now stands. You must make a U-turn on this score. *All,* as opposed to hardly any, of the software we now run on our 400s or 800s, should run on our 1200s. Why the heck shouldn't it? The machines are just *too darned similar* to justify incompatibility! This syndrome is beginning to seem chronic.

While you are at it, bring back *controller jacks 3 and 4* (you can put them on the righthand side). We have games such as *Asteroids* from Atari itself, that call for the extra ports, and we can drive parallel printers from them. The monetary savings from dropping them were mere pennies, anyhow. Then redesign that ROM *cartridge jack* so our third-party cartridges will fit. Did you really do that on purpose?

Now you're back on the right track. Let's take a look at the connectors that should be available on the back panel of the new 1200 XLE. For starters, let's stick on a *bus slot* that corresponds to RAM slot 3 on the *modular* Atari 800, so we can plug in expansion boards, or maybe even an expansion chassis, for multiple boards. That way we can gain easy 80-column capability, bank-selectable RAM, and other capabilities yet undreamed of. Here is a novel thought: let's actually *encourage outside hardware development.* Remember, that's a big part of what made those fruity fellows down the street from you so popular.

Next to the expansion bus, we should find the *parallel port.* A Centronics style connector would be really civilized. Let's face it, guys. We loyal fans might just want something a little hotter than an Okidata Microline 80 hanging off the side of our 1200 XLEs. This is not

At last, the first home video joystick that puts the firing button where it should have been in the first place.

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Outpost: Atari, continued...

meant as a slight to Oki—but how about a 92 as opposed to an 80? Or something like the Mannesmann Tally MT160L—the difference between 40 and 160 cps.

It should not matter to you guys *what* printers we want to hook up—just give us a standard parallel port, and we'll take it from there.

Oh, and the sight of an RS-232 *serial port* would bring tears to our eyes. But no, we shouldn't even suggest it to you. It would be too good—too generous—too thoughtful. Why, if you did that, we could attach the *modem* of our choice to our 1200 XLEs, in much the way we hooked up our parallel printers . . .

ATARI HOME COMPUTERS
COMPUTER DEMONSTRATION CENTER

The computer demonstration center features an interactive videodisc to guide a new user through a tour of the 800. Coupling of the Atari with a laserdisc is now being offered to the outside world, as well.

Hey, you know what would be savvy? If you built *Microsoft* Basic *into* the unit. That way the Atari Basic cartridge would remain standard, while at the same time Microsoft software would finally become economically viable on an Atari machine, as every owner of a 1200 XLE would have Microsoft Basic. And how about an RCA phono jack for audio output? Many of us would like to hook our 1200s up simultaneously to monitors and external amplifiers—something which is now tricky to effect from one DIN.

A cart chock full of 1200s waiting to move next door for final assembly.

Unreasonable demands that would make the cost of the 1200 skyrocket beyond all market limits? Absolutely not. They could be addressed for a reasonable additional cost. Unreasonable demands that could not realistically be crammed onboard the 1200? Absolutely not. We have snooped around the 1200 board, and believe that these features could be fit into the sexy 1200 XLE case. Unreasonable demands that would at the very least dictate a total redesign of the Atari 1200? Probably. But fellas—if

Components that can be stored on rolls are "stapled" right on to the boards using machines like this one.

you had only done things right the first time . . .

Send 'Em a Message

Fellow Atarian, I urge you to write Atari now and let them know how you feel—they claim to be all ears. Attach a copy of "The Thinking Man's Atari" portion of this column to your letter if you want. Maybe, just maybe, Atari will come around. Their address is P.O. Box 427, Sunnyvale, CA 94086.

Atari Silencer

It is commonly known that in addition to the capability of driving sound through a television or monitor speaker, the Atari has an on-board speaker, similar to the Apple. This speaker serves nearly without exception to flag admonitions of one sort or another, such as a record or playback state on cassette, or an illegal entry in a word processing or similar program. It also provides the chirp of "keyclick" on the Atari keyboard.

The only problem with the on-board speaker is that it drives you crazy. Some programs exploit the speaker so sadistically it makes you wonder whether the programmer was hard of hearing. I even find keyclick distracting—perhaps it is necessary on the 400, but not the 800. The Atari 1200 XL has no internal speaker, by the way, and pipes keyclick out to the TV, where a volume control beckons. One of the commonly asked questions I get at the Outpost is how to shut the darned thing off. As I mentioned last month, I know of no way to do it through software. One answer is to drop the speaker right out of the unit, which is a relatively simple task. But it does have an air of permanence about it.

John Loveless, of Synapse, *where a lot of exciting things are planned for the Atari. They are the folks to beat.*

What could be simpler than the installation of a single pole, single throw switch to cut out the speaker when desired? The snag: the thought of snipping wires or drilling holes in my pristine Atari 800 made the hair on the back of my neck stand on end. Also, though the warranty on my machine had long since expired, I wasn't happy with the idea of doing anything that couldn't be undone. Service people can be put off quickly when they see user modifications. I determined, rather wistfully, that I would live without a speaker.

Then, while engaged in the hobby of staring at all the little packages on the wall of the nearby Radio Shack, I made a fascinating discovery. I saw a product called "two prong connectors," catalog number 274-342, $2.49 for a package of six. I noticed that the fit would be quite close to the connector used on the Atari speaker. And wow, you sure can obtain really tiny toggle switches nowadays. "SPST micro miniature toggle switch," catalog number 275-624, $1.59. So small, it can mount between the vent slots on the bottom of the 800. I could then envision a switch modification that was utterly reversible. If ever I need to bring my Atari in for service, the modification can be slipped out in under five minutes.

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Outpost: Atari, continued...

If you wish to modify your Atari 800, you will need in addition to the products listed above, about two feet of bell or other light wire, a flat blade and Philips screwdriver, soldering iron and solder, and a bit of electrical tape.

Snip the wire into two 10" lengths. Then, take one of the wires and snip it into two 5" lengths. Strip 1/4" of insulation off the ends of all leads. Twist the shorter wires onto the longer wire as indicated in Figure 1. This will make the modification easier to slip in and out later. Next, solder two connectors and the switch to the wires as indicated in the diagram. Unscrew all collars around the neck of the switch. Notice you are using only the socket connectors, not the plug connectors. Leftovers can be saved for another project.

Now you are ready to begin the operation. Disconnect your Atari, and flip it over onto something soft, like a pillow. Unscrew the five screws that hold the bottom panel, and lift it toward you. Notice that the controller ports must be cleared to remove the panel. Can you believe how small that speaker is? Thank goodness you don't depend on that measly thing for all your sound effects. To disconnect the speaker, pull gently on the connector. Once the speaker is disconnected, remove it from the machine.

Orient the connector so that it matches the view in Figure 2. Using a screwdriver or a toothpick, press down on the silver tongue on top of the plastic connector, as you gently pull the wire from the side. Don't force anything! When you have pressed the tongue down far enough, the contact will slide right out. Pull both contacts out of the plastic container.

Next, take the bottom panel you earlier removed and hold it so that the vents are at the bottom, as shown in Figure 3. You will mount the switch in the lefthand vent, where there is room to spare, and nothing nearby to short accidentally. Insert the flat blade screwdriver in the slot where the switch will be mounted (it's a good idea to stay over toward the left—this will make the switch easier to reach). Gently twist the screwdriver to spread open the slot, then press the neck of the switch through. The plastic will have to bend a bit to accommodate the switch. Put on a washer, then screw on the switch lock nut to fasten it in place.

Final installation will be facilitated by repositioning the back panel so that the computer looks like an open valise. This way, the wire between switch and speaker will not be stretched. First, press the speaker contacts into the middle connector, as indicated in Figure 4. The speaker can now be repositioned in its spot. Gently connect the far socket to the speaker leads from which you removed the original plastic connector. Spreading them a bit will insure a tight fit. Finally, tuck the wire away under the keyboard post and away from boards and the speaker itself. There is more than enough room on that side of the computer to keep the modification from interfering with any other components.

It is a good idea to tape the original connector to the modification wire itself. Then, should you wish to put things back the way they were, the original connector won't be lost in a drawer somewhere.

Screw the back panel on, plug things back in, and run a test by typing CONTROL-2, which rings the bell, with the toggle toggled. The chirp of keyclick will also be gone—if and when you want it to be so.

Listen: the sound of silence.

Autorun Your Basic Programs

One of the most frequently asked software questions we get is how to make

Figure 1.

Illustrations courtesy of SoftSide, 6 South Street, Milford, NH 03055.

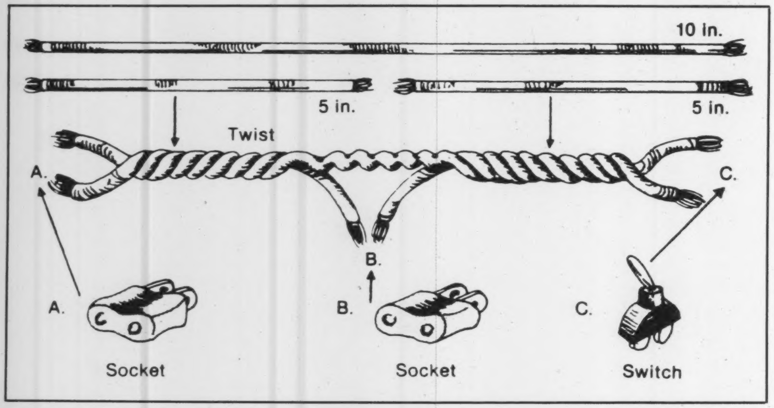


Figure 2.

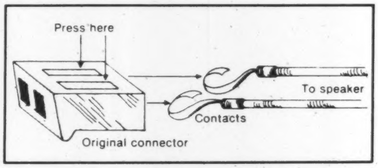


Figure 3.

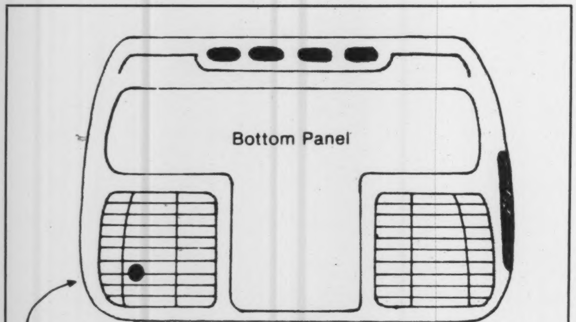
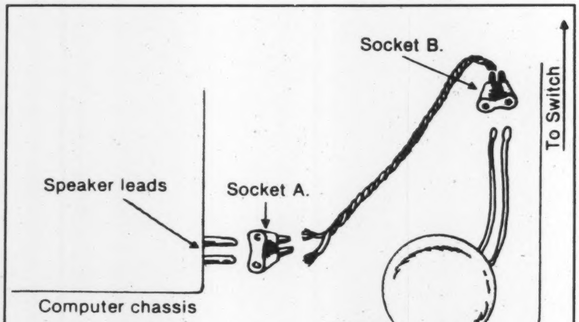


Figure 4.



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Outpost: Atari, continued...

Basic files autorun. You won't find it in the DOS manual, so don't waste your time looking as I have. But thanks to John Humble of Mercer Island, WA, creation of autorun files is now made delectably easy.

Listing 1 will take just a few minutes to type in, and makes any Basic program into an AUTORUN.SYS file. First it asks for the name of the file you want to make bootable. Then it checks to see whether an autorun file already exists on the disk in question. If it does, the program asks whether you wish to overwrite that file. Then it finds the program you indicated, and makes it into the AUTORUN.SYS file, using our old friend, the dynamic keyboard method.

John also sent us Listing 2, which is a very short and sweet menu program. Put this program onto a disk full of other programs, then use the program in Listing 1 to make it autorun. The program will read the directory from the disk, and store each title in a string. The titles are then printed on the screen with a letter in front of each one; running them is as simple as pressing the letter of your choice. Good job, John, and thanks.

Next month: compacting data into graphics characters, and the complete program listing of a deluxe self-modifying title card generator from our January competition. Catch you then! ☐

```
5 DIM A$(12),B$(1),FN$(14)
10 PRINT CHR$(125):PRINT "THIS IS A PROGRAM THAT YOU CAN USE TO MAKE A
   BASIC";
15 PRINT " PROGRAM BOOTABLE":PRINT
20 PRINT "PLEASE ENTER THE NAME OF THE BASIC    PROGRAM THAT YOU WANT TO
   MAKE ";
25 PRINT "BOOTABLE";:INPUT A$:PRINT
30 PRINT "PUT THE DISK IN THE DRIVE THAT HAS":PRINT A$;" AND DOS 2.0 ON IT"
40 PRINT "THEN HIT RETURN"
50 INPUT B$:TRAP 80:OPEN #1,4,0,"D:AUTORUN.SYS"
55 PRINT "THERE IS ALREADY AN AUTORUN.SYS FILE  ON THIS DISK"
60 PRINT "DO YOU WANT TO WRITE OVER IT?":? "TYPE YES OR NO":INPUT B$
65 IF B$="Y" THEN 80
70 END
80 TRAP 40000:TRAP 90:FN$(1,2)="D:":FN$(3)=A$:CLOSE #1:OPEN #1,4,0,FN$:
   CLOSE #1
85 GOTO 100
90 PRINT "PROGRAM ";A$;" IS NOT ON THIS DISK":TRAP 40000:GOTO 20
100 FN$="D:AUTORUN.SYS":OPEN #1,8,0,FN$
110 FOR X=1 TO 6:READ A:PUT #1,A:NEXT X
120 FOR X=1 TO 74:READ A:PUT #1,A:NEXT X
130 FOR X=1 TO LEN(A$):A=ASC(A$(X,X)):PUT #1,A:NEXT X
140 PUT #1,34:PUT #1,155
141 FOR X=1 TO 20-LEN(A$):PUT #1,0:NEXT X
142 FOR X=1 TO 6:READ A:PUT #1,A:NEXT X
150 CLOSE #1
160 PRINT "PROGRAM COMPLETED"
170 DATA 255,255,0,6,95,6
180 DATA 169,2,133,85,169,0,133,86
190 DATA 169,2,133,84,162,0,169,9
200 DATA 157,66,3,169,55,157,68,3
210 DATA 169,6,157,69,3,169,255
220 DATA 157,72,3,157,73,3,32,86,228
230 DATA 152,169,0,133,85,133,86,133,84
240 DATA 169,11,141,74,3,96,80,79,75
250 DATA 69,32,56,52,50,44,49,50,58,82
260 DATA 85,78,32,34,68,58
270 DATA 224,2,225,2,0,6
```

Listing 1.

```
10 GRAPHICS 0:OPEN #2,4,0,"K"
20 DIM FILENAME$(64*17),FILE$(17),F$(20)
25 POKE 82,1:PRINT :PRINT
30 OPEN #1,6,0,"D:*.*"
40 TRAP 900
45 FOR X=1 TO 63
50 INPUT #1,FILE$
55 IF FILE$(5,16)="FREE SECTORS" THEN 70
56 IF FILE$(11,13)="SYS" THEN X=X-1:GOTO 65
57 IF X/2=INT(X/2) THEN POKE 85,20:PRINT " ";
60 PRINT CHR$(64+X);" ";FILE$;:FILENAME$((X-1)*16+1,(X-1)*16+16)=FILE$
65 NEXT X:GOTO 45
70 PRINT :? :? :PRINT "TYPE LETTER OF PROGRAM TO RUN"
75 GET #2,A:A=A-64:PRINT CHR$(64+A)
77 FILE$=FILENAME$((A-1)*16+3,(A-1)*16+13)
80 F$="D:"
81 FOR X=1 TO 8
82 IF FILE$(X,X)=" " THEN 85
83 F$(LEN(F$)+1)=FILE$(X,X)
84 NEXT X
85 F$(LEN(F$)+1)="."
90 F$(LEN(F$)+1)=FILE$(9,11)
100 RUN F$
900 END
```

Listing 2.

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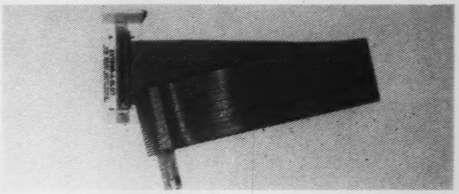

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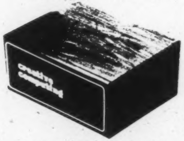

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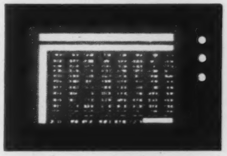

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CIRCLE 283 ON READER SERVICE CARD

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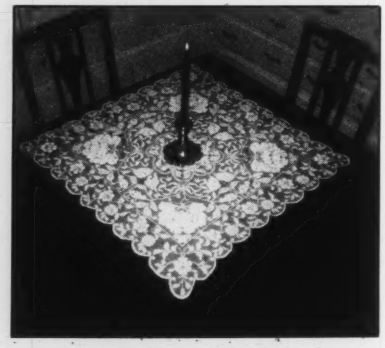
Susan Glinert-Cole

As one might suspect from the column header, Will Fastie is not responsible for this month's column. Will has given out that he has taken another position which promises greater gains in money, prestige, and so forth. In fact, he has retired to nurse the broken heart for which this month's author is responsible. It was I who fell in love with his father and caused two full paragraphs in the November '82 issue of this magazine to be devoted to a wholehearted tirade against a certain paternal person of indisputable romantic character. In order to really make me feel guilty, Will invited me to take the place of one whose life was irretrievably ruined by an accidental mixup by Baltimore Information.

Will further refused to suggest what I should write about this month. Flipping through back issues revealed that two columns were devoted to a certain dilapidated table and the garage to which it had been relegated.

To begin the transition as smoothly as possible, I present a similar photo. This article of furniture is known around our house as the dining room table. For six months it was variously referred to as the-table-which-would-be-the-dining-room-table-if-it-didn't-have-your-computer-on-it and the-table-on-which-I-would-like-to-eat-my-dinner-but-it-has-your-computer-on-it. The computer now resides in a hallway on a perfectly normal, but tasteful desk as our garage (unlike Will's) is a barn whose roof flakes off during any mildly vigorous atmospheric perturbation.



Will has the advantage over me in that his desk is probably littered with letters, software, and multi-function gadgets, thus a few minutes spent stirring up the pile probably causes ideas for this column to seed themselves. Unfortunately, my desk is littered mostly with core dumps from an IBM 360/370 course which I seem to have signed up for in my spare time. Underneath the core dumps I did locate my printer, which, as it is not the IBM/Epson, but the NEC 8023A dot matrix, is sufficiently unique to warrant some discussion.

The NEC 8023A Dot Matrix Printer

I bought the printer about ten months ago and it has worked splendidly ever since. When I was shopping around for a printer, the NEC appeared to offer considerable advantages in speed, print

Passing the Buck

Now see, I'm not sure what to say here. On the one hand, I want to tell you not to believe a word Susan says about me, especially given her past disruption of my life. On the other hand, we can all clearly see from her first column that she is bright, witty, technically competent, and mildly charming. And believable. I think you'll continue to enjoy "IBM Images."

So will I. But I must confess to a great sadness about moving on. *Creative* is my favorite magazine (oops, I mean my second favorite magazine), one I have read for years, one I will continue to read faithfully. My new boss summed it up very well saying "It's so interesting!" It is, and will continue to be so. Even without me.

For those of you interested, the reason for my departure from these pages is a new magazine, *PC Tech Journal.* Executives from Ziff-Davis bound and gagged me, took me into the deep, dark recesses of One Park Avenue, and threatened me with a wonderful company, great people, and more money until I succumbed and agreed to take the job as editor. I know you will never forgive my weakness. But do you have any idea how much a new Volvo station wagon costs? More than I can afford even still, actually.

It has been a most pleasant experience writing this column for the last eighteen months. I thank you for your interest and your letters of encouragement, and I hope I have been of some help to you. A special thanks is due Betsy Staples for her continued support, trust, and good humor. And now that she doesn't have to coddle me, she's a lot less cranky.

And now we know for sure that MacArthur was right: Old writers never die, they just become editors.

—WF

Susan Glinert-Cole, RFD #2, Box 389A, South Windham, ME 04082.

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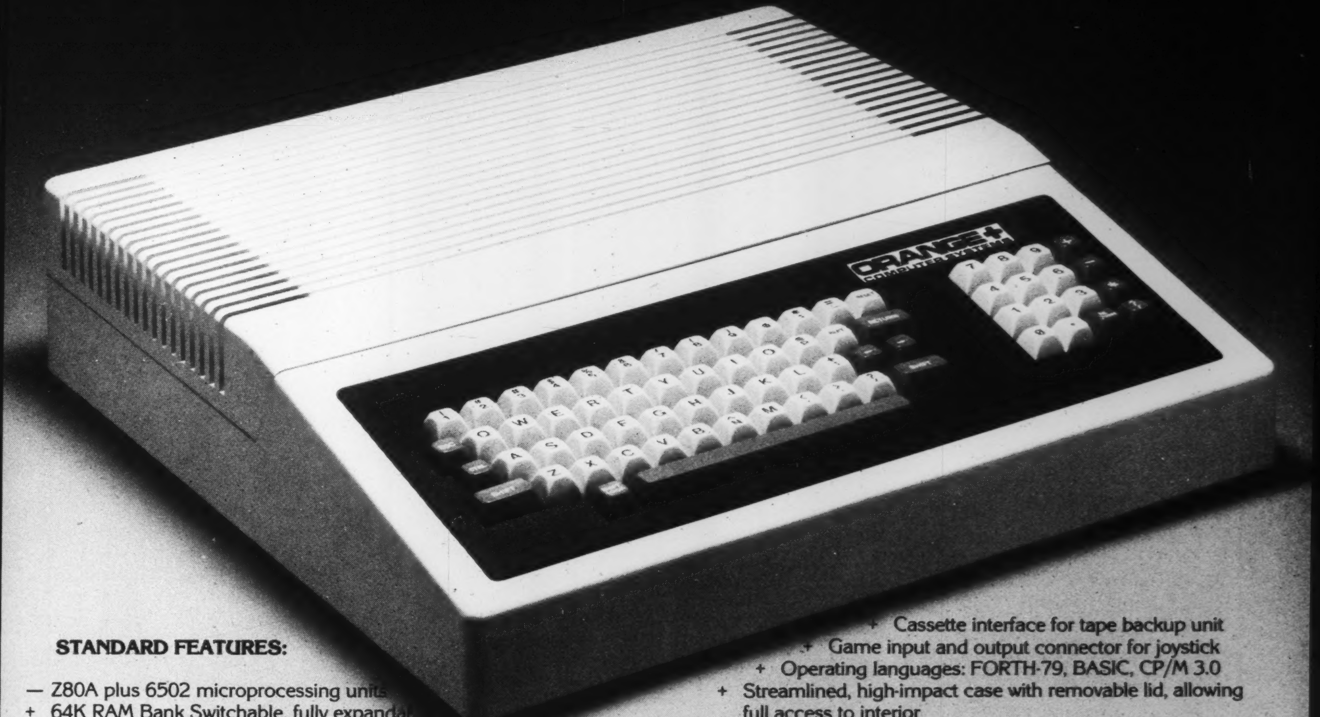

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CIRCLE 181 ON READER SERVICE CARD

quality, and versatility. Friction pin feed and dot graphic capability are standard features. It also has a 1.5K buffer, which has been a reasonable substitute for a print spooler. The NEC is also faster (100 cps vs. 80 for the Epson) and doesn't blat at you when it runs out of paper, a feature on the Epson which I found obnoxious. Even with these extras, the price was slightly less than the Epson, and much less than the IBM printer, so I plunked my money down for the NEC, and have had only three regrets since.

First, when the graphic screen dump programs emerged from the software houses, they were all written for the Epson. If I had wanted to fool around with the dot graphic capabilities, it would have been necessary to write the screen dump program myself. Somehow I never got around to doing this, and so have never been able to take advantage of this feature. I understand that there does exist such a program, and that it is available from Aegis Systems for $25, but I have never seen it and so cannot comment.

Next, a minor problem presents itself when one wants to use the PrtSc key. Hitting PrtSc causes the screen to be printed all right—all on one line. The dip switch 1-8 is normally set to emit a carriage return at the end of a line; to get the necessary linefeed, this switch must be set to the other position. Unfortunately, this produces an extra line feed when a file is sent to the printer from disk. Since 1) I can rarely find my dip switch flipper when I want it, and 2) locating the switch requires a flashlight (something else I usually cannot find when I need it), I do not use PrtSc.

The third regret really has nothing to do with the printer, except that it is hard to use one without those little gizmos called printer ribbons. This regret actually didn't surface until a few months after we had been making noisy music together and the ribbon was gamely producing light grey copy.

I called the place where I had purchased the printer and was told that they didn't stock the ribbons because they were too difficult to get. They neglected to tell me this, of course, when I bought the printer. They did tell me where to call and guess what, the ribbons had been on back order for five months. I called seven or eight other places and discovered that NEC printer ribbons were backordered all over the galaxy. Hum. It took an additional month to get the replacements.

As soon as the new ribbons arrived I dissected the inkless one and can report that both the high cost and tenuous availability can be worked around with a kitchen knife and a bottle of stamp pad ink. Grasping the knife in one hand and the ribbon cartridge in the other, carefully pry off the top of the case. The ribbon is neatly packed like ribbon candy inside. If you are too vigorous in working off the top, you will likely have printer ribbon in places you never dreamed of. Substitute stamp pad ink for the knife and liberally squirt the foam rubber cylinders, around which the ribbon travels, with the ink. Snap the top back on the case and wind the ribbon through at least one complete circuit. This takes longer than you could imagine.

It is now possible to purchase the ribbon in a separate packet for $7.99 from the Check-Mate Company and insert it yourself. The ribbon replacement kit comes complete with a pair of disposable gloves (for the fastidious). This has definite advantages over the pry and squirt routine and costs less than a whole new cartridge. Check-Mate does sell new cartridges at a considerable discount ($9.95), so for only two more dollars, the interesting problems which result when the ribbon gets out of control can be avoided.

NEC Printer Formatting Program

The program in Listing 1 may be a little out of keeping with the more common MS-DOS/Basic programs which are usually found around here, but I thought it useful enough to include for those folks who have the NEC 8023A and some type of Pascal around. This program was written with the UCSD p-system Ver. IV.1 from Network

Listing 1.

```
PROGRAM FORMAT;

{AUTHOR : SUSAN GLINERT-COLE}

{$I-}    {* TURN OFF IORESULT *}

USES {$U #5:USERLIB.TEXT} SCREENOPS, COMMANDIO;
{ USES SCREENOPS AND COMMANDIO SEGMENTS, LOCATED IN USERLIB.TEXT}



{******************   INSTRUCTIONS   ************************

This program will format an input file which has the proper codes
imbedded in the text.

The form is as follows:

 Use the left bracket ( < = function key #2) to begin instruction.
 Use the right bracket ( > = function key #4) to end instruction.

          The codes are:

             N = Pica  (this is the default face)
             E = Elite
             P = Proportional
             B = Bold, or double strike
             C = Condensed
             U = Underlined
             D = Double width letters
             T = Top of form
             M = left margin

           1/6 = 1/6 inch line spacing  (this is the default)
           1/8 = 1/8 inch line spacing  ( for cross stitch patterns)
            XY = Y/144 line spacing

            -  = cancel code and must preceed each single code


 Examples:

 <BC>    =  bold condensed
 <UE>    =  underlined elite
 <-B -E>  = cancel bold and cancel elite
 <M10>    = left margin begins ten spaces in from edge of page
 <C-U>    = condensed face and cancel the underscore


 Miscellaneous notes:

   1. .text must follow the filename
   2. condensed face is cancelled by requesting any face (eg, N,P,E)
   3. to configure the printer in general, use CONSOLE: for input file.
   4. when using any command that needs integer input, place the command
      inside its own set of brackets.}
```

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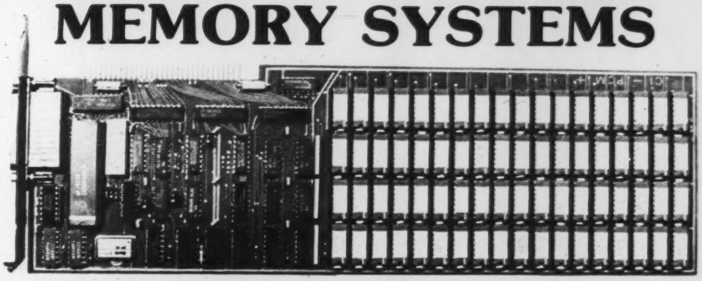

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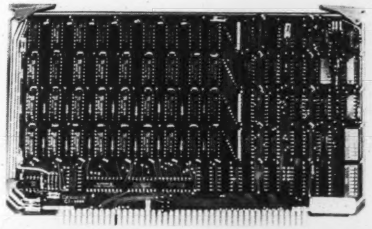

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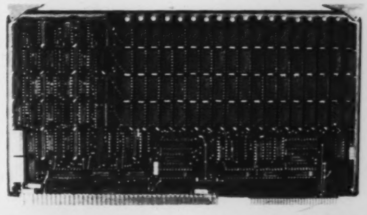

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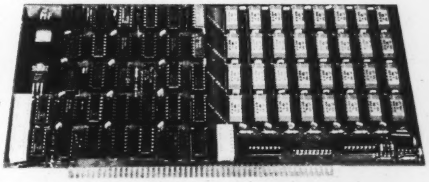

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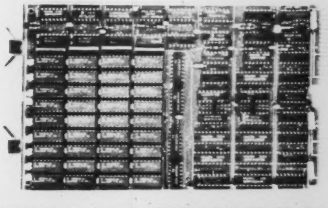

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CIRCLE 136 ON READER SERVICE CARD

Consulting, an operating system of which I am embarrassingly fond and will have more to say about later. The program takes any text file and formats it using embedded printer codes. It can easily be adapted to the Epson; the version I wrote in Basic is not as convenient to use, but I will try to clean it up and include it at a later date.

Listing 1, continued.

```
  VAR
    FILE_NAME   : STRING;       {EXTERNAL FILE ASSOCIATED WITH F}
    SKIP_PERF   : BOOLEAN;       {SKIP PERFORATIONS ?}
    CH          : CHAR;         {CHARACTER READ AND WRITTEN}
    LINE, X     : INTEGER;        {COUNTER FOR TOP OF FORM}
    ESC         : CHAR;         {ESCAPE CODE = ASCII 27}
    STOP,OK     : BOOLEAN;       {STOP IS FOR REDIRECT,OK IS REDIRECT}
    F,P         : TEXT;         {P IS INTERNAL FILE FOR PRINTER}
                              {F IS INTERNAL FILE FOR FILE_NAME}
    LEFTMARGIN  : INTEGER;
    PAGENUMBER  : INTEGER;

    DOOMSDAY     : BOOLEAN;
    PICA, ELITE  : BOOLEAN;
    PROPORTIONAL : BOOLEAN;


 PROCEDURE GET_PRINTER_CODE (CH :CHAR);

    VAR
      Y  : INTEGER;

    BEGIN

      ESC := CHR(27);

      IF CH IN ['a'..'z'] THEN                  {CONVERT TO UPPER CASE}
        CH := CHR( ORD(CH) - 32 );

      CASE CH OF

        'N'  : BEGIN
                 PICA := TRUE;
                 WRITE (P,ESC, 'N');         {PICA}
               END;
        'E'  : BEGIN
                 ELITE := TRUE;
                 WRITE (P,ESC, 'E');         {ELITE}
               END;
        'P'  : BEGIN
                 PROPORTIONAL := TRUE;
                 WRITE (P,ESC, 'P');         {PROPORTIONAL}
               END;
        'B'  : WRITE (P,ESC, '!');          {BOLD}
        'C'  : WRITE (P,ESC, 'Q');          {CONDENSED}
        'U'  : WRITE (P,ESC, 'X');          {UNDERLINE}
        'D'  : WRITE (P,CHR (14));           {DOUBLE WIDE}
        'T'  : WRITE (P,CHR (12),CHR(13));   {TOP OF FORM}

        '1'  : BEGIN
                 READ (F,CH);         {THIS READS THE '/'}
                 READ (F,CH);
                 CASE CH OF
                   '6' : WRITE (P,ESC, 'A');     {1/6 LINE SPACING}
                   '8' : WRITE (P,ESC, 'B');     {1/8 LINE SPACING}
                 END; {THIS CASE}
               END; {CASE OF 1}

       'X'  : BEGIN
                READ (F,Y);
                WRITE (P,ESC, 'T', 'Y');          {Y/144 LINE SPCNG}
              END;

      'M'  :  BEGIN
                READ (F,Y);                    {SET LEFT MARGIN}
                LEFTMARGIN :=Y;
                IF Y DIV 10 = 0 THEN
                  WRITE (P,ESC,'L00',Y)
                ELSE
                  WRITE (P,ESC,'L0',Y)
              END;
```

```
       '-'  : BEGIN                 {CANCEL CODES}
                READ (F,CH);
                IF CH IN ['a'..'z'] THEN
                  CH := CHR (ORD(CH)-32);
                CASE CH OF
                  'E','P' : WRITE (P,ESC, 'N');    {RETURNS TO PICA}
                  'B'     : WRITE (P,ESC, CHR(34)); {CANCEL BOLD FACE}
                  'C'     : BEGIN                {CANCEL CONDENSED}
                              IF ELITE THEN WRITE (P,ESC,'E')
                              ELSE IF PROPORTIONAL THEN WRITE (P,ESC,'P')
                              ELSE WRITE (P,ESC, 'N');
                            END;
                  'D'     : WRITE (P,CHR(15));   {CANCEL DOUBLE WIDE}
                  'U'     : WRITE (P,ESC, 'Y')   {CANCEL UNDERLINE}
                END; {THIS CASE}
              END; {CANCEL CODES}
           END; {CASE}


       END;     {* GET PRINTER CODES *}


 PROCEDURE DO_ERROR; FORWARD;         {FORWARD DECLARATION}


 PROCEDURE  GET_FILE;

 VAR
   ACCEPT     : SC_CHSET;
   ANSWER     : CHAR;
   CHAR_BACK  :BOOLEAN;
   Z          : INTEGER;


   BEGIN
     CHAR_BACK := FALSE;
     ACCEPT := ['Y','N'];
     SC_CLR_SCREEN;
     GOTOXY(1,2);
     WRITE ('FILE NAME ?  [ CONSOLE: IS FOR THE KEYBOARD ] ');
     READLN (FILE_NAME);

     IF FILE_NAME = ''
       THEN EXIT (FORMAT)
     ELSE
       IF (FILE_NAME <> 'CONSOLE:') AND (FILE_NAME <> 'console:') THEN
         RESET (F, FILE_NAME);

     IF IORESULT <> 0 THEN
       DO_ERROR
     ELSE

       BEGIN
         ANSWER := SC_PROMPT ('SKIP PERFORATIONS? Y)es  N)o ',-1,3,1,3,
                 ACCEPT, CHAR_BACK,',');

           IF ANSWER = 'Y' THEN
             BEGIN
               SKIP_PERF := TRUE;

               GOTOXY (1,4);
                 WRITE ('=======> PLACE TOP OF FORM UNDER');
                   WRITELN( ' PAPER BAIL');
               FOR Z := 1 TO 11000 DO Z:= Z * 1; { WAIT }
             END
           ELSE
             SKIP_PERF := FALSE;

      IF FILE_NAME = 'console:' THEN FILE_NAME := 'CONSOLE:';
      IF FILE_NAME = 'CONSOLE:' THEN
        BEGIN
          GOTOXY (1,5);
          WRITE ('ENTER CODES BETWEEN  <> BRACKETS...');
          WRITELN ('TYPE  CONTROL C TO EXIT KEYBOARD ');
          RESET (F,FILE_NAME);
        END;

     END; {NO IO ERROR}

  END; { * GET  FILE *  }
```

Listing 1, continued.

```
PROCEDURE DO_ERROR;


  TYPE
    REPLY = ( R,Q);
  VAR
    CHAR_BACK : BOOLEAN;
    ANSWER    : CHAR;
    ACCEPT    : SCCHSET;


  BEGIN
    CHARBACK := FALSE;
    ACCEPT := ['R','Q'];

    ANSWER := SC_PROMPT ('FILE NOT FOUND... Q)uit or R)edo ? ',
          -1, 3, 1, 1, ACCEPT,CHAR_BACK,',');

    IF ANSWER = 'R' THEN
      GET_FILE
    ELSE
      EXIT (FORMAT);

  END;  { * DO ERROR * }


PROCEDURE WRITE_FILE;


  BEGIN

    LINE := 1;
    REWRITE (P,'PRINTER:');         {** OPEN PRINTER AS FILE **}
    PAGENUMBER:=1;

    WHILE NOT EOF (F) DO
      BEGIN
        IF (LINE = 60 )AND (SKIP_PERF) THEN
          BEGIN
            FOR X:= 1 TO 2 DO WRITELN (P);
            FOR X:=1 TO 38-LEFTMARGIN  DO WRITE (P,' ');
            WRITELN(P,'PAGE ',PAGENUMBER);
            FOR X := 1 TO 7 DO WRITELN (P);
            LINE := 4;
            PAGENUMBER:=PAGENUMBER+1;
          END;

        WHILE NOT EOLN (F) DO
          BEGIN


            READ (F,CH);

              IF CH =  '<'  THEN
                  REPEAT
                    READ (F,CH);
                    GET_PRINTER_CODE (CH);
                  UNTIL CH = '>'

              ELSE  {CH IS TEXT}
                WRITE (P,CH);

          END; {EOLN CHECK}

        READLN(F);
        WRITELN(P);
        LINE:= LINE + 1;

      END; {EOF CHECK}

      IF SKIP_PERF  THEN              {LAST PAGE NUMBER}
        BEGIN
          FOR X := 1 TO 60-LINE DO WRITELN (P);
           FOR X := 1 TO 38-LEFTMARGIN  DO WRITE (P,' ');
           WRITELN (P,'PAGE ', PAGENUMBER);
        END;
  CLOSE (F);
 END;    {*  WRITE FILE  *}

   BEGIN    {***   MAIN PROGRAM   ***}

     DOOMSDAY := FALSE;

     REPEAT
       GET_FILE;
       OK := REDIRECT (' PI=F, PO = P');
       WRITE_FILE;

     UNTIL DOOMSDAY

  END.    {***   MAIN PROGRAM   ***}
```

The UCSD p-System

The UCSD p-system is not in common use among IBM PC owners. I am acquainted with the argument that, because most people don't use it, it is not a fit item for discussion. I maintain that if its advantages were trumpeted, more people would use it, so, at the expense of aggravating proponents of the former argument, let me indulge in the latter one.

One of the objections to the p-system which immediately leaps to the eye is its formidable price. This can run from $625 (for the IBM version) to $848 (for the Network Consulting version). These prices are misleading, since the system includes a great many utilities which an MS-DOS user ends up purchasing separately anyway.

Admittedly, $840 is a considerable sum of money to expend all at once, so, in an effort to soothe the pecuniary sting, I list in Figure 1 some of the utilities included in the system, with an approximate cost for separate purchase.

Figure 1.

Pascal	$ 350
8088 Assembler	$ 100
RAMDisk	$ 35
Print Spooler	$ 25
Fancy Disk Utilities	$ 80
Full Screen Editor	$ 100
Screen Utilities for Pascal	$ 150
8087 Support	$ 150
Communications Package	$ 75
Depressing Total	$1065

Since all these programs are integrated into one operating system, they are designed to work together in a cohesive manner. There is the further advantage that, in the event of a crisis, there is only one phone number to locate. The people at NCI have been courteous and helpful when I have contacted them.

Excellent use is made of meaningful on-screen prompt lines; I found these a welcome relief from the cryptic A> of MS-DOS. Even with little plastic reminder cards that fit around the keyboard, I can never seem to remember the proper sequence of colons and letters, and I gave up trying to commit to memory a series of poorly spelled commands. (CHKDSK? CKDSK? CKDISK? CHCKDSK?). A well-formed operating system should present a set of choices from which one can delicately pluck the desired command. A well-formed programmer has many more important things to deal with than the precise syntax of the operating system of the moment.

IBM Images, continued...

The system is easily configured to your personal idiosyncracies and, as source code is provided for some of the utilities, you can customize these as well. The source code also provides a wonderful insight into the finer points of the operating system, and an excellent education can be gotten from reading these programs for both form and content.

The poundage and the complexity of the documentation appear formidable, but it is extremely well written and quite comprehensive. The flavor is one of gentle and chatty instruction and conveys the philosophy of a system which has been designed for the convenience and education of the end user, who is encouraged to participate in its further development.

If I have any criticism of the documentation, it is that it is presented in several separate notebooks, with updates and IBM variants scattered somewhat untidily throughout. Most of my questions were eventually answered somewhere in the documentation, but locating the information sometimes took perseverence.

The documentation is not meant to be a tutorial on Pascal; the NCI version of the p-system comes with *The UCSD Pascal Handbook*, which is a tutorial for the experienced programmer. For the not-so-experienced programmer, a useful adjunct is *Programming the IBM Personal Computer: UCSD Pascal*, by Seymour Pollack. This last book has many interesting and engaging programming problems at the end of each chapter. I was especially taken with the one concerning broccoli ice cream.

Another objection I have heard is that p-code is slow compared to the native code generated by IBM Pascal. All of the benchmarks I have seen have shown this to be true and I believe them. In most cases, the programs I have written run with no delay; it is this benchmark with which I am really concerned. P-code can be speeded up by compiling critical sections to native code and by turning off range checking. I have never found either of these tricks necessary to improve performance, but programs which do a great many numerical calculations will probably see a considerable improvement using these two compiler options.

The most outstanding exception to the adequate speed comments above is a graphics program that draws a fancy fedora in living color. It takes 45 agonizing minutes to run in p-code and 40 minutes to finish in Basic. I tried all of the tricks I could think of to speed it up with absolutely no effect. I run the program for such company as is fascinated by fancy fedoras and expect that when I purchase the 8087 numeric co-processor the hat will whip onto the screen in a flash of digital lightning. I will include this program in another column for stopwatch and fedora aficionados.

P-code may not walk away with any ribbons for speed, but the size of a compiled program is downright dainty compared to that produced by IBM Pascal. Since I bought my machine more than a year ago, it boasts antique, noisy, single sided disk drives and a measly 64K of memory. The very concept of a three pass compiler that generates bulky object code and requires 128K of memory just to exist filled me with more than a vague ennui. As you have probably gathered by now, the author is excessively lazy and avoids, when at all feasible, such tiresome occupations as memorization, disk-swapping and racing into computer rooms to turn off a blatting printer. It is a safe bet that the author can be described as a textbook version of a couch potato. The author, therefore, will never be very fond of any computer gadget which might cause her to expend energy when there is a better alternative available.

PSYCHIATRY
STEIN

"To put it simply, I'd say you've developed a leak in your think tank."

I have heard it said that few programs are written to run in the p-system environment. There certainly isn't the plethora of programs one finds for MS-DOS and CP/M. Most of the programs which are written with the p-system include a run-time package. The end user has every right to be oblivious to the gory details of the operating system. However, anyone who enjoys program development and system twiddling will find the p-system flexible, accommodating and complete enough that additional utilities are really not needed. The original argument I put forth at the beginning of this discussion holds true: if people did take advantage of this elegant package, plenty of software would become available. The pioneering spirit should not have died out already among computer buffs.

A friend of mine, after having read the above, asked why I didn't discuss the IBM p-system. I have two perfectly splendid answers to this astute question. First, I don't own the IBM version. The NCI version came equipped with all sorts of extra utilities such as programmable function keys, hard disk, double sided and quad density disk support, RAMdisk, 25% more disk storage by using ten sectors per track instead of IBM's eight, and a custom screenops package. These features alone were worth the extra expense of NCI's version, and there are other extras included that you can read about if you send for information.

The second reason is even better than the first one. As soon as I began writing this column, I beetled on down to the local Computerland to do some intelligent comparisons between the two versions. Unfortunately, IBM has recalled its version of the p-system to whatever nirvana is reserved for recalled software, so there was not a copy to be found for me to do my intelligent comparisons with. No explanation was forthcoming from Computerland as to why the p-system had vanished in a puff of blue smoke. Judging from the performance of the IBM Fortran Compiler, wretched performance does not appear to be an adequate criterion for recall. This leaves us to speculate about defective ring binders and hub reinforcers. I hope that I will have an opportunity to examine the IBM version when it reappears.

Kaleidoscopic Entertainment

Maine is not exactly the Hub of the Universe; it wasn't until I had been living here for a year that I found another IBM PC user (to be perfectly accurate, he found me). After some friendly phone conversations which centered around living in Searsport (if possible) and making a living writing software (if possible), I received in the mail a copy of Once Begun Computation's entry into the software market. Being snowed in for the better part of the winter obviously had nothing but a beneficial effect on the imagination and care with which this package was put together (who said cabin fever is universally debilitating?).

The packaging and graphic design of this product are really unique. The disk comes boxed in a neat white plastic case and sports a gold write-protect label. The program in not copy-protected and an extra label is included in the package for the backup copy. The program is as visually compelling as the wrapping, although its intensity can be somewhat boggling after a while.

As the name suggests, *Kaleida* generates kaleidoscopic graphics which are entertaining or artistic, depending on your orientation. The size, rate of change, and colors are all controlled by function keys. This allows enough interaction with the design to prevent the visuals from becoming too hypnotizing. On the other hand, you can easily avoid temporarily the income tax, oil bills, and other nefarious concepts by booting *Kaleida,* pouring some wine, and turning off the lights. The price is only $12.

Useful Gadget

Disk drives and smoke, ho hum. We heat mostly with wood, which is incredibly dirty, and I have been protecting my disk drives from disaster with plastic bags. Aside from the unaesthetic appeal of old vegetable bags flapping from the front of a very expensive machine, this routine works fine. While I have been trained as a scientist, I do engage in some forms of superstitious behavior, in particular, every month I bring an offering to the expensive machine in the hopes that doing so will keep it from breaking down.

Last month, peace of mind was obtained by spending a mere $8 on a disk drive cover from Nat Hellman III Associates. The cover is an oblong piece of textured black vinyl (with a handle) that fits snugly into the disk drive recess. It is easy to remove when changing disks and is a fine substitute for old plastic bags. I am sorry to report that, while the cover looks great and functions perfectly, the expensive machine was not satisfied with an offering that cost less than $500. Fairly promptly after I proffered the disk drive cover, it blew its system board out in a silicon snit. I will leave a description of this adventure for another time, and have promised the expensive machine either double sided disk drives or 512K of memory for the month of March. This appears to have had a placating effect. ☐

Firms Mentioned in This Column

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Check-Mate, 51 Diauto Dr., P.O. Box 103, Randolph, MA 02368. 1 (800) 343-7706.

Nat Hellman III Inc., 400 South Beverly Dr., Suite 214, Beverly Hills, CA 90212. (213) 273-0133.

Network Consulting Inc., 110-3700 Gilmore Way, Burnaby, B.C., Canada V5G 4MI. (604) 738-3500.

Once Begun Computations, Searsport, ME 04974. (207) 338-1082.

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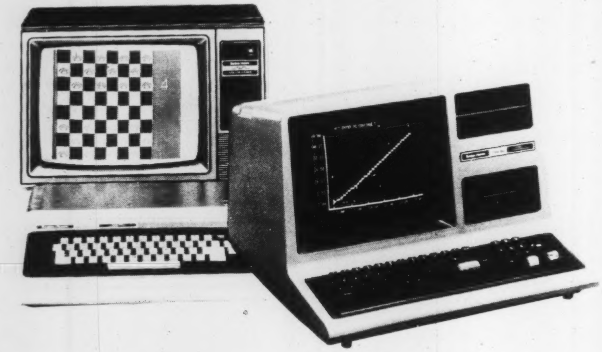


rings...trs-80 strings...tr

Stephen B. Gray

As the fifty-second star is sewn on the TRS-80 flag, we look at the Model 12 that replaces the Model II, Radio Shack's support for outside software writers, a database program for creating adventure games, the new version of *CopyArt,* a screen cleaner, and a short program that creates abstract displays.

Model 12 Replaces Model II

The TRS-80 Model II (Aug. 1979, p. 30), designed for "professionals and small businesses," has been replaced by an enhanced version called the Model 12 (Figure 1), which closely resembles the Model 16 (June 1982, p. 216) and has 80K of memory instead of 64K, more expansion slots, etc.

The 12 has a green screen like the 16 and the same slim-line double-sided disk drives; two fit in little more width than the single built-in drive of the II. The keyboard has a "low profile," meaning that it is thinner than the keyboard of the Model II, making it a little more comfortable to use on your lap, if you prefer to type that way.

Seven of the command keys to the left and right of the Model 12 keyboard have narrow tops, to reduce the chance of hitting ENTER or TAB or SHIFT—or whatever—by mistake. The Model II has only two programmable function keys on the numerical keypad; the 12 has eight. The reset switch on the II has been replaced by a button and recessed to make it a little harder to hit by mistake.

The II has only four plug-in card slots; up to seven boards can be plugged into the optional card cage ($199), installed behind the rear access panel of the 12, for adding the 144K *VisiCalc* memory expansion board for larger spreadsheets, the hi-res graphics board, the Model 16 upgrade kit for 16/32-bit processing, etc.

All current Model II software will run on the 12, which has the same "fawn-grey" color as the 16; a Model 12 can be

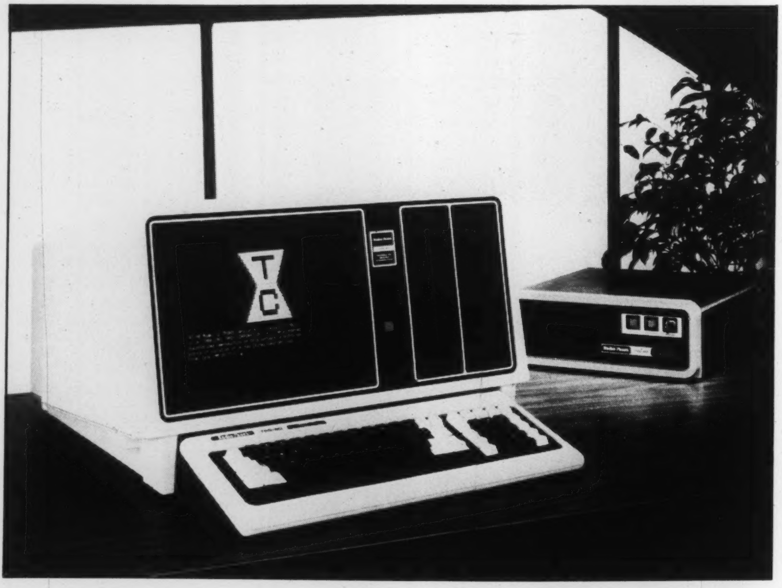
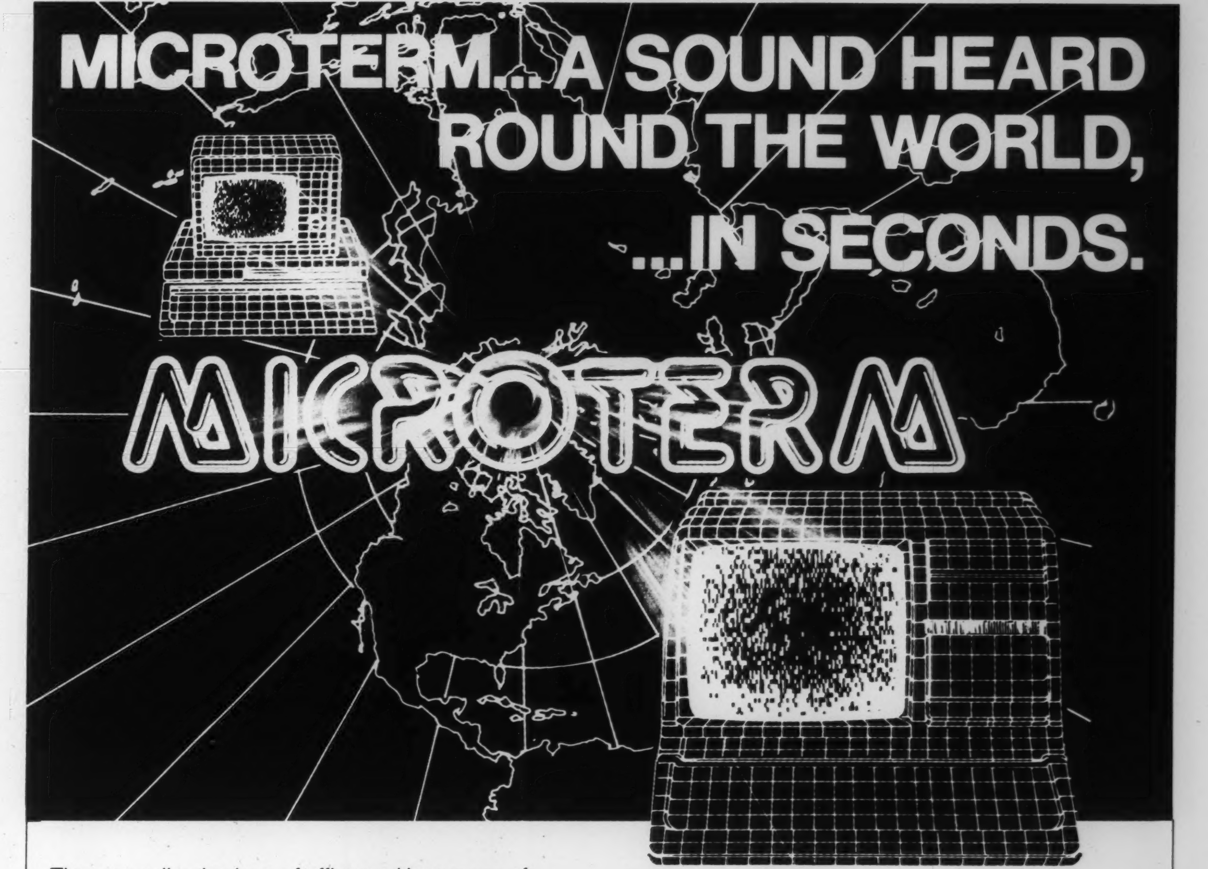


Figure 1. The Radio Shack TRS-80 Model 12, which replaces the Model II, has two slim-line disk drives in only a little more space than the II uses for one.



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upgraded to a 16. The new TRSDOS 4.2 disk operating system (an enhanced version of TRSDOS 2.0) supports double density, single or double sided 8″ floppy disks.

The 80K Model 12 is $3199 with one disk drive, $3999 with two. Each disk stores 1.25 megabytes, as against 416K per disk on the II. When introduced in the 1979 RSC-3 catalog, the 64K one-disk Model II was $3899; in the 1983 RSC-8 catalog, the same II is $3499.

Support for Outside Software Writers

Up to now, Radio Shack has offered software written in-house, or software written outside but sold under the Radio Shack label, or successive editions of the *Applications Software Sourcebook* (containing brief descriptions of programs neither "examined or tested" in Fort Worth).

Anyone wishing to write TRS-80 programs for sale outside Radio Shack was on his own, because the company gave help only if the programs were to become Radio Shack products.

Radio Shack has now instituted an Outside Software Support Program to assist, professional third-party software vendors with marketing and technical support. Under the new program, Radio Shack will review outside software, and if it passes, will include it in a software referral guide to be available in Radio Shack stores. The guide will contain an evaluation of the package and tell where it can be bought. The company will also consider making the software a Radio Shack product, if the vendor wishes.

Why has Radio Shack started this support program? To make more software available, says one of the company's executives. To improve the company's market share, says a vocal New Englander, adding that Apple's aid to third-party manufacturers helped give Apple the largest chunk of the market.

If an outside writer's application is accepted by Radio Shack, he becomes a member of the program and receives Technical Information Guides to the hardware he is using, Software Development Guides used in-house by Radio Shack, internal library routines for standardizing packages, and TRSDOS licensing if desired (for a one-time fee of $500 without royalties).

Among the basic rules: no games will be evaluated, and the outsider "must be able to support any user problems with the package" when customers telephone for help. If you're interested, write for an application form to Software Support/Review Program, Radio Shack, 1300 One Tandy Center, Fort Worth, TX 76102.

Game Database Program

The Alternate Source (704 N. Pennsylvania, Lansing, MI 48906) offers a monthly magazine called *TAS* for assembly language mavens (Mar. 1982, p. 202), and a variety of games and utility programs. They sent me a unique program for creating adventure games, for a 48K Model I or III TRS-80.

The Adventure Program ($39.95 on disk or tape) consists of three adventure games, an editor to change them to suit your personal preferences or to create new games, and a drive program to run the database created by the editor.

The database is the actual adventure; by changing it, you create different adventures. The database consists of:

- Reader information: A header containing information the player will need to know.
- Action entries: The known player inputs, conditions, and commands.
- Vocabulary entries: All the words (verbs and nouns) the player may use in this particular adventure.
- Message text: The messages used by the adventure and controlled by the actions.
- Room description: List of directions to other rooms, along with room descriptions.
- Object description and starting locations: Tells what the objects are, and where they are.
- Action titles: Optional text descriptions of the actions; not used in playing the game but useful in editing.
- Trailer information: Version number, adventure number and a checksum.

Action entries are the heart of the adventure, and are stored as eight numbers. The first determines where the action is to be evaluated, the next five are conditions to be met (or parameters for the commands), and the last two bytes specify what commands are to be performed if all the conditions are met.

There are 20 possible conditions, such as IN/W for the player being in the same room as the object (the condition fails if the player is either holding the object or if the object is in any other room), or ORIG for the object being in the same room it started in (the condition fails if the object is in any other room or is being carried).

The last two bytes of the action entry consist of four command codes, for which there are 149 possibilities, such as NIGHT for darkening a room, DROPX for dropping an object in the same room as the player, and DEAD to turn the light on in the room, move the player to the last room, and tell him he is dead.

Vocabulary entries include words such as GO, GET, DROP, ANY, NORTH, WEST, and UP.

Instructions

The manual provides rules for entering a user adventure, such as "If the action entry uses commands which require parameters, there must be parameters in the condition line. If not, strange messages and objects will appear."

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The longest chapter gives instructions for using ADVEDIT, the program that edits the adventures, with commands such as READ, MODIFY, INSERT, LIST and PRINT. ADVEDIT can handle up to 300 action entries, 150 vocabulary entries, 100 rooms, 100 messages, and 150 objects.

The last chapter provides a short sample adventure with an in-depth explanation of the database.

A New Language

Writing a new adventure (or editing an old one) with this program is not a simple matter of sitting down at the keyboard for a few minutes and knocking out a red-hot odyssey. Although *The Adventure System* simplifies much of the work, you must learn the adventure language, which has an extensive set of commands. This means you can write a rather complex adventure, and that takes time if it is to be new and exciting.

The final page of the manual notes that many problems were encountered in writing the adventures contained in the initial package, and that although most of the problems are documented in the manual, there is still much be explored, and new techniques will probably evolve. So there is a newsletter, "Augment," at $12 a year, which provides updates, consultation on marketing your own adventures, support programs for *The System,* and discounts for adventures.

In a recent ad, The Alternate Source offered an "Adventure Package" of two games (Isle of Doom and Lost City of Gold) created with *The Adventure System* ($15.95 on tape, $19.95 on disk), with this note: "All media is unprotected! TAS adventures allow you to SAVE up to 10 versions of the game in progress!"

If you are really into adventures, or just want to get a good idea how they are made, try this system, which seems to be one of a kind.

CopyArt II

No sooner did I review *CopyArt* (Jan. 1983, p. 334) than a new and improved version, *CopyArt II,* was introduced by Simutek Computer Products Inc. (4897 E. Speedway Blvd., Tucson, AZ 85712).

CopyArt II, priced at $149.95, is a word processor that offers graphics, math, sorting, and mail-merge utilities. Columns may be created for journals and reports, and Basic programs can be edited.

According to Mike Gariepy, president of Simutek, the differences between the new and old versions are as follows: "We cleared up some of the hard-to use functions. We added:

- *Scripsit* load commands, so you can load *Scripsit* files directly without having to save them in ASCII format.
- A sorting command, for sorting lines of text in ascending or descending order.
- A math package (similar to *VisiCalc,* but only a little), which prints the result in the text.
- A mail list program, which holds up to 2000 names on the Model III.
- A mail-merge program, for personalized form letters."

CopyArt II, Mike says, is flexible enough to do a simple accounts receivable.

Simutek now has customized drivers for most printers, available separately at $19.95 each. You get one driver of your choice with *CopyArt II,* which now works with hi-res printers such as the Prowriter (which is the same as the C. Itoh 8510 and the NEC 8023; they're all made by C. Itoh).

CopyArt previously worked only on the TRS-80 (Models I and III); it will now work on all TRS-80 look alikes, including the LNW and PMC-80, according to Mike.

If you already have *CopyArt* can you upgrade to *CopyArt II?* Yes, if you previously registered your copy; you get a 200-page manual with two disks by sending Simutek $15 plus the serial number of your copy of *CopyArt.*

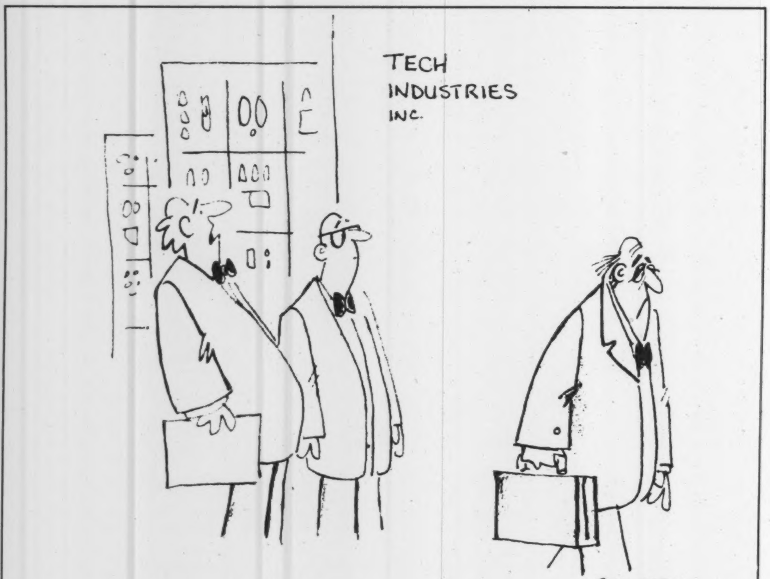
Screen Kleen

Cleaning your TRS-80 screen isn't all that easy, especially if you don't do it very often. A kleenex or cloth usually doesn't do the job properly, because of static electricity, and a wet cloth can be dangerous. TRS-80 manuals, like most computer manuals, don't cover preventive maintenance.

According to the news release accompanying a product recently sent to me, a "revolutionary new scientifically developed cloth" called Screen Kleen is designed "to remove dust from the screen of a CRT terminal. If dust remains on the screen during chemical cleaning and destating, it can act like sandpaper, etching the screen and causing an eventual decrease in the clarity of images." ("Destating" means applying an anti-static liquid spray.)

Besides cleaning CRT glass, "Screen Kleen can be used on screen overlays where many destat chemicals cannot. Compressed air just moves the dust around not remove it [sic]. Screen Kleen is an excellent remedy for easy removal of paper dust from printers. It can also be used to clean dust from walls, ceilings, desk tops, and any other equipment in the computer room or office."

Screen Kleen seems to be cheesecloth impregnated with a waxy, odorless substance. Just now I used it to clean the screens of several computers, and it worked quite well, left no trace of residual dust, and also cleaned the keyboards quite nicely. Because of the waxy impregnant (to which the dust adheres), the material can be folded into shapes that easily get into the spaces between



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TRS-80 Strings, continued...

Listing 1.

```
10 CLS
20 ON RND(3) GOTO 30, 90, 140
30 X1=RND(128)-1: X2=RND(128)-1: Y=RND(48)-1
40 IF X1>X2 OR X2-X1>Y THEN 30
50 IF (X2-X1)/2=INT((X2-X1)/2) THEN 30
60 FOR X=X1 TO X2
65 IF POINT(X,Y) THEN RESET(X,Y) ELSE SET(X,Y)
70 NEXT X
75 X1=X1+1: X2=X2-1: IF X1>=X2 THEN 20
80 Y=Y-1: GOTO 60
90 Y1=RND(48)-1: Y2=RND(48)-1: IF Y2<Y1 THEN 90
100 X1=RND(128)-1: X2=RND(128)-1: IF X1>X2 THEN 100
110 FOR Y=Y1 TO Y2: FOR X=X1 TO X2
120 IF POINT(X,Y) THEN RESET(X,Y) ELSE SET(X,Y)
130 NEXT X,Y: GOTO 20
140 IF RND(25)<>1 THEN 20
150 FOR Y=0 TO 47: FOR X=0 TO 127
160 IF POINT(X,Y) THEN RESET(X,Y) ELSE SET(X,Y)
170 NEXT X,Y: GOTO 20
```

Listing 2.

```
100 ........... IF X1>X2 THEN S=-1 ELSE S=1
110 FOR Y=Y1 TO Y2: FOR X=X1 TO X2 STEP S
```

Listing 3.

```
110 ......... FOR X=X1 TO X2 STEP ((X1>X2)*2+1)
```

keys. (It's also good on shoes.)

The news release says "Dealers are being contracted nationwide to carry Screen Kleen." By mail order, it is $2.95 for two cloths in a plastic bag, from CRT Products Co., 2013 Franklin St., Detroit, MI 48207. Computer clubs are offered three dozen bags for $64 from this division of MWB Industries.

Short Program #39: Triangles and Rectangles

From Keeseville, NY, Stephen Havens sends this letter: "Here is a short program I wrote on a TRS-80 Model III. It randomly draws triangles, rectangles, squares, and lines on the screen. As the program randomly draws, it will set a block if it is reset, or reset a block if it is set." (See Listing 1.)

Not all that short a program, but it creates pictures very similar to some works of modern art hanging in museums around the world.

If the RND(3) in line 20 comes up with a 1 or a 2, the program draws triangles (by branching to line 30) or rectangles (by branching to line 90). Depending on the value of X1, X2, Y1 and Y2, the rectangles may turn out to be squares or lines.

If the RND(3) in line 20 generates a 3, and if the RND(25) in line 140 then comes up with a 1, lines 150-170 will paint the entire graphics area white, except where blocks have already been set, in which case they reset them. Thus, once in a great while, the picture on the screen will be reversed. If you prefer the picture to be reversed only when you decide it merits the change, you can alter lines 20 and 140 accordingly.

Lines 40-50 reject values of X1 and X2 that create triangles whose bases would have to be drawn from right to left, or triangles whose base is wider than their altitude, or triangles whose base is an even number of graphics blocks wide (can you figure out which case is which?).

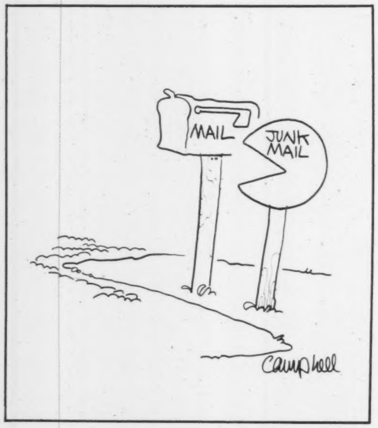
Lines 60-80 draw the triangle; if line 65 finds a block set, it resets it. The triangle is always isosceles, because each succeeding "layer" is reduced in length by 1 at each end. If you prefer right triangles whose hypotenuse aims at the top right of the screen, delete

`X1=X1+1`

from line 75. If you prefer that hypotenuse to aim at the top right of the screen, delete the

`X2=X2-1`

from line 75. (Can you rewrite the program so that all three types of triangles will appear randomly?)



Lines 90-100 set the size of the rectangle and reject rectangles that would have to be drawn from right to left. Lines 110-130 draw the rectangle; if line 120 finds a block set, it resets it.

The third part of line 100 offers the simplest solution to the problem of X1 being larger than X2: go back to the beginning of the line and get new values of X1 and X2. However, if you want a slightly more elegant program, there are at least two ways to avoid having to return to the beginning of line 100.

The first requires adding a STEP function to the third part of line 100 and to the second part of line 110. (See Listing 2.)

which can be expanded to take care of rectangles that would have to be drawn from bottom to top, and which are rejected by the third part of line 90.

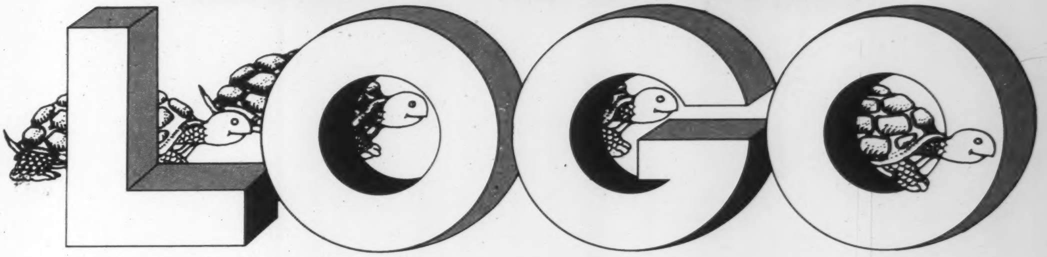
The second way to avoid having to return to the beginning of line 100 is a little more sophisticated, and combines the two revelant parts of new lines 100 and 110 by comparing X1 with X2. (See Listing 3.)

If X1 is larger than X2, the comparison returns a -1; if smaller, a 0. Now multiply each by 2 and add 1, and the result is -1 if X1 is larger than X2, or +1 if X2 is larger than X1. Thus, the rectangle can be drawn regardless of which is larger.

How about line 40, which rejects triangles whose bases would have to be drawn from right to left? Can't you change line 40 (and line 60) in the same way we just changed lines 100-110? Yes, but then you might have trouble with line 75, the line that shortens each succeeding layer at both ends. Does line 75 assume the base will be drawn from left to right, and would it therefore have to be changed if the base could be drawn in either direction?

In the original program, which was part of a typed letter, line 90 ended with 100 instead of 90. This had to be a simple transcribing error, made in copying the program from the screen, rather than what the author really intended. To see why, change that line-end 90 to a 100, and you will find that the display includes a great many more rectangles that are no more than lines. Why? ☐

LEARN TO SPEAK



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Steve Gray

TRS-80 Assembly Language Subroutines, by William Barden, Jr. Prentice-Hall, Inc., Englewood Cliffs, NJ. 239 pages, paperback $18.95. 1982.

The front cover says this is "A collection of easy-to-use subroutines for your TRS-80," and the back cover says using them "can increase productivity and reduce the tediousness of programming."

Deciding which assembly language subroutines to publish is difficult; you can't please everybody. Ten of the 65 subroutines are for conversion, such as ASCII binary or decimal or hex or octal to binary, or vice versa. Seven are for graphics, including drawing horizontal or vertical lines, boxes, or moving dots. Four involve comparing or searching strings. Nine are math subroutines for multiplying or dividing 8 by 8, or 16 by 16, or adding or subtracting multiple precision BCD. Four involve display: scrolling the screen up or down, or clearing it.

Each of the 65 subroutines is very well documented, and includes a complete description of what the subroutine does, the I/O parameters, the algorithm, a sample calling sequence with input and output values, notes on special uses or features, a decimal listing, and a CHKSUM on the validity of the data.

Each subroutine is usable as given, so it doesn't have to be used in a Basic program, and each is completely relocatable. They are all slanted toward the Models I and III, but many can be used on the TRS-80 Model II.

For those needing an introduction to assembly language programming, the two opening chapters provide 24 pages that help you to understand the use of the subroutines. However, a few drawings would greatly help in understanding Z80 registers, instructions, and addressing modes. And some sections, such as on relative addressing, are too tough for beginners.

For those who haven't the time or inclination to learn to write in assembler, this book provides the next best solution, assuming you need enough of the subroutines provided. Barden usually writes clearly and concisely, and the book—with the few exceptions noted—is a model of excellent writing, editing and production.

Codes, Ciphers and Computers: An Introduction to Information Security, by Bruce Bosworth. Hayden Publishing Co., Rochelle Park, NJ. 269 pages, paperback $13.95. 1982.

This introduction to both traditional and recent cryptographic techniques includes over 80 Basic programs for writing and cracking many types of codes and ciphers. (A code uses words or symbols to represent the message words; a cipher substitutes characters for the original letters or transposes the characters of the original message.)

views...book

After two chapters that introduce the subject and look into code systems, there are chapters on Cipher Systems, Cryptography and Computer Operations, Cryptoanalysis Security and the Data Encryption Standard, Public-Key Cryptography, and Cryptographic Security Systems. A 22-page primer on Basic is provided in an appendix for those not familiar with the language, followed by answers and solutions to the dozen or two questions at the end of each chapter. For those who want to read further, each chapter includes a long list of references to books and articles.

Despite a slight tendency to wordiness, this book is a gold mine of information for anybody interested in the basics of using a computer to write or read ciphers. The programs range from a simple one that generates a three-letter code word dictionary to one that can "crack" a Caesar ciphertext message using trial and error. In between are programs for reversed zigzag transposition cipher, algebraic file scrambling encryption, Vignere table encryption, linear function encryption, etc.

No programs are included in the last three chapters, but there is a fine description of how DES works (a rather complicated system, but if you have understood the previous chapters, you should get it) and also of PKA, the public-key algorithm, which may soon rival the DES.

If you're interested in codes and/or ciphers, and have a computer you can program in Basic, buy this book.

Computer Literacy: Problem-Solving with Computers, by Carin E. Horn and James L. Poirot. Sterling Swift Publishing Co., 1600 Fortview Rd., Austin, TX 78704. 312 pages, paperback $13.95. 1981.

Instruction Manual to Accompany Computer Literacy, by Horn and Collins. 195 pages, paperback $7.95. 1981.

Designed for use by the beginning student with no previous computer-related coursework, this text was written to provide an understanding of computer technology, the effects of computers on society, and how computers solve problems.

The 13 chapters include an Introduction, Computer Jargon, History of Computing, Computer Applications, Computers in Government, The Value of Information in Society, Computer-Related Occupations, Computers and Humans, Computer Systerms, Computer Components, Algorithms and Flowcharting, Computer Programming and Design Logic, and Beginning Basic. The book ends with a nine-page bibliography (with six references to articles in *Creative* and other publications, giving a year, volume and number, but without the name of the article or its author), and a 14-page glossary (with some inexact or incomplete definitions, such as "Micro-chip - containing more than one microprocessor.")

The book is profusely illustrated with photos, drawings, and flowcharts. Each chapter ends with various exercises, some calling for filling in blanks, others for matching words with phrases, or multiple-choice, or tasks such as "explain why the following variable names are illegal."

The writing is rather prosaic, often dull, but the book manages to cover the subject about as thoroughly as might be expected.

The Instruction Manual provides, according to the opening remarks, "a general guide to what students should learn to be computer literate, not how they should be taught." So the manual contains "chapter summaries, pertinent facts, answers to chapter exercises, additional review materials, and things to do."

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The manual layout has the light-hearted and imaginative touch the text should have, with many old illustrations from a 1905 issue of *Country Life*, a variety of typefonts (mostly typewriter). However, the writing style is also rather prosaic, with less than half the imagination of the layout.

---

119 Practical Problems for the TRS-80 Pocket Computer, by John Clark Craig. TAB Books Inc., Blue Ridge Summit, PA 17214. 308 pages, paperback $9.95. 1982.

Although the front cover says "New techniques for getting the most from your computer's data storage and programming capabilities," there is only one feature that looks new; the author provides an All-Purpose Driver (he has even trademarked the name), which "acts as an operating system for Basic. By ending your programs with GOTO1, instead of END, and running your programs in the DEF mode, the computer will always return to this operating system at the end of a run, and you can start another program just by typing its label." The driver consists of two very short lines.

The introduction says the programs "cover a wide range of subjects. There should be programs of interest for just about everyone." Well, most of these are programs you could write yourself, if you had a little programming experience and the time to write them. However, for those without the second qualification or without either, this is one of the better collections of short Basic programs, mainly because there are so many, you are bound to find a few you might use now and then.

The 119 programs include six games (Lunar Landing, Deal 'em, Numb), a couple of financial programs (Loan, Checkbook), six electronics (Decibels, Resistor Analysis, Balanced Bridge), statistics (Mean and Standard Deviation, Chi-Square), engineering (Simultaneous Equations, Polygon Area), and others (Bessel Functions, Curve Fit, Distribution, Histogram Bins, Integrals, Logarithms to Any Base, Pi by Dartboard, Random Numbers, Wind Chill Index).

To keep down the size of the book, a bare minimum of text is provided with each listing (usually just a few sentences) and an example. However, for most of the programs, such as Euler Numbers, if you have to ask what they are, you don't need them.

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All in all, this is better than any other current collection of TRS-80 Pocket Computer programs, mainly because of the wider choice, and also, 8 cents a program is a lot less than the value of the time it would take you to write one of them.

TRS-80 Data Communications Systems, by Frank J. Derfler, Jr. Prentice-Hall Inc., Englewood Cliffs, NJ. 167 pages, hardcover $18.95, paperback $12.95. 1982.

Subtitled, "A guide to the operation of TRS-80 microcomputers as communication devices," the back cover says this book "shows how any student, businessperson, or hobbyist can use the TRS-80 to communicate with information utilities and message systems."

The eleven chapters cover the role of data communications, the fundamentals (RS-232C, ASCII, bits, bauds), the TRS-80 serial port, modems, terminals, using the TRS-80 as a terminal, the TRS-80 Model II, microcomputer-based message systems, communications for the deaf (Teletype, AMRAD, Infone), large-scale communications network, and The Future. A four-page appendix provides addresses of manufacturers and distributors of data communications products.

The 4 1/2 page glossary doesn't include all the technical words in the book, such as *nibble*. Although this of itself is a small thing, it is one of many indications that this book may have been produced in a hurry. The chapters that explain the technology have almost no drawings at all; apparently nobody put the manuscript in front of a beginner (actually, or figuratively) for comments. Chapters 2 and 3, on fundamentals and the TRS-80 serial port, contain two drawings altogether, despite many, many places that cry out for explanatory figures. What you get instead is over four pages of ASCII and EBCDIC codes, and over a dozen tables on programming the TRS-80 UART.

The three subsequent chapters, on modems, terminals, and using the TRS-80 as a terminal, contain many photographs and some drawings, but they are a little late for the reader who is somewhat hazy over the technology because he couldn't picture, from the previous text alone, what goes on inside the devices. The writing is rather muddy in some important places where precise exposition is needed, and a little too compact for the beginner, who usually needs a more detailed text; this reads too often like a reference manual.

The book is a disappointment, doubly so because it comes from Prentice-Hall, which usually does a top-notch job on technical books. However, if you know enough about bits and bauds, the book is quite useful in telling you what is available in data communications for the TRS-80, but in that case, you would need only about 57 of the 167 pages.

Computers in the Schools: A Guide for Planning, by Ronald G. Ragsdale. The Ontario Institute for Studies in Education. 252 Bloor St. West, Toronto, Ont., Canada M5S 1V6. 112 pages, paperback $6.75. 1982.

The preface carries two warnings: "the intended audience" for this book is "those people who have already acquired some knowledge and/or interest about computers"; the second has to do with the amount of objectivity in much of the material. This book presents one person's view of the world of computers in education."

The first four chapters provide the foundation for discussion.

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Chapter one considers the basis for school use of computers in a general way, while chapters two through four provide more detailed descriptions of the ways in which computers are used in instructional settings.

Chapters five and six deal with how the use of computers is likely to affect elementary and secondary teachers, and chapter seven describes how administrative functions might be connected to the instructional setting.

Three additional aspects of computer use are dealt with in chapters eight through ten. Chapter eight considers the equipment and its implications; chapter nine discusses evaluating equipment and computer programs; while chapter ten deals with the organization and control of this new technology.

Chapter eleven offers some suggestions "as to where we should begin in our efforts to maximize the advantages that computers can offer us, and at the same time, minimize the possible disadvantages."

Reading this book requires wading through large pages of solid text that takes many words to say what could be expressed in much less space, and more to the point. Also, the chapter on Equipment Needs, when mentioning hardware, usually refers to special Canadian equipment, such as the Canadian Educational Microcomputer, the ECNO Network, and Telidon, none of which can be of much interest to non-Canadians. The only non-Canadian hardware mentioned is the DEC VAX 770 and PDP-11, and those only very briefly.

If you're a Canadian educator, you may find some value in this book; others won't.

Practical Data Base Management, edited by Auerbach Publishers Inc., Reston Publishing Co., a Prentice-Hall Co., Reston, VA. 444 pages, hardcover $24.95. 1981.

According to the preface, "The primary objective of this book is to provide an easy-to-read, organized guide to the practical issues of planning, designing, and implementing data base-supported information systems."

The 23 chapters are divided into six parts: Management Perspectives (planning, management issues, system development life cycle), Data Base Environment Components (the data base management system, data dictionary/directory, function of data base administration, user/system interfaces, data independence), Evaluation and Selection of Software (criteria, alternative approaches to DBMS performance evaluation, alternate architecture for active data dictionary/directory systems), Administration of the Data Base Environment (organization and job descriptions, impact of personal privacy requirements, data base supported systems and auditing), Design and Development methodology, tradeoffs in design), Current Directions (trends in data base systems, the backend computer, operational and technological issues in distributed data bases, technology of data translation).

Although this book may be somewhat daunting, with page after page of solid text, there is more than enough here to satisfy almost anybody's need to understand data bases, written in an information-packed, straightforward style that is almost all lean meat, with only a slight tendency to wordiness in some places.

Although not intended as a comprehensive tutorial, this book presents practical experience and insight for the practicing manager who is "responsible for the planning, design, implementation, and maintenance of a data base environment."

views...book

Using Basic, by Rich Didday and Rex Page. West Publishing Co., 50 West Kellogg Blvd., St. Paul, MN 55165. 538 pages, paperback $17.95. 1981.

The authors say in the preface that the central theme of this textbook is practicality, and that it presents a practical approach to system design, useful programs that solve problems often met by practicing programmers, user-friendly programs that save time and frustration, and portable programs that will run on various Basic systems with minimum changes.

The book is said to differ in several ways from other introductory texts in Basic, by concentrating on a standardized form of the language (ANSI Minimal Basic), by emphasizing program methodology, by emphasizing practical applications, and by using an interactive, experimental approach to learning to program.

Part I is an eleven-chapter, 300-page self-contained introduction to Minimal Basic, written for the beginner. Part II, 110 pages long, Applications of Standard Basic, contains a small variety of subjects, including simulation, sorting, packing and pointing. Part III, Enhancements to Basic, covers several features not yet standardized: strings, files and "other enhancements" (longer variable names, multi-statement lines, logical operators, and four more).

Three different audiences will find this text useful, according to the preface—business programming, general programming, and general computer knowledge—and a table suggests "possible avenues through the book suited to each of these interest groups."

Seven appendixes provide information on how to use a computer, a glossary, concise description of Minimal Basic, answers to odd-numbered exercises, index, two-page guide to Basic commands, and a brief Quick Reference Guide.

The book is full of helpful boxes around important points. The writing style is light and informal, with cartoons that illustrate various points, and a slow and easy approach to Basic.

This is one of the easiest and more worthwhile Basic books to read, with a more meaningful set of programs than most such texts, and a light-hearted touch that helps over the rough spots but never gets silly. This user-friendly text seems to reflect a lot of teaching experience. □

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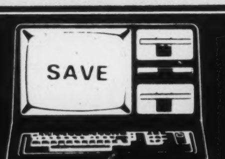

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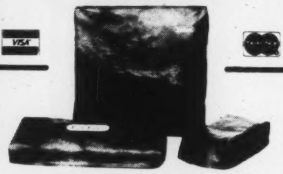

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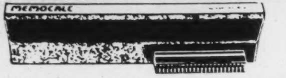

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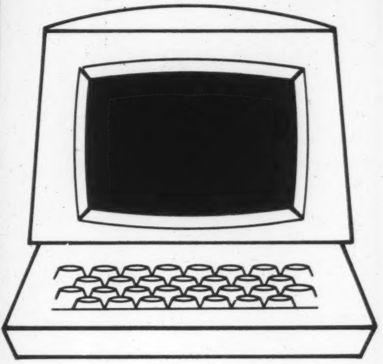

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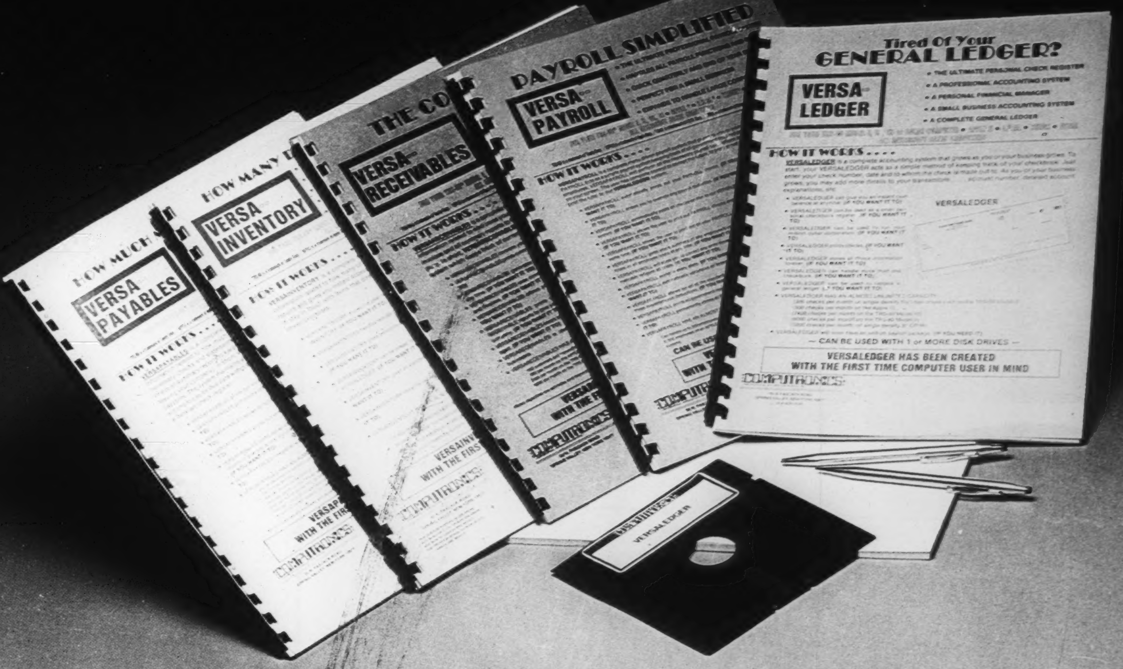

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